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The OIL AND GAS JOURNAL

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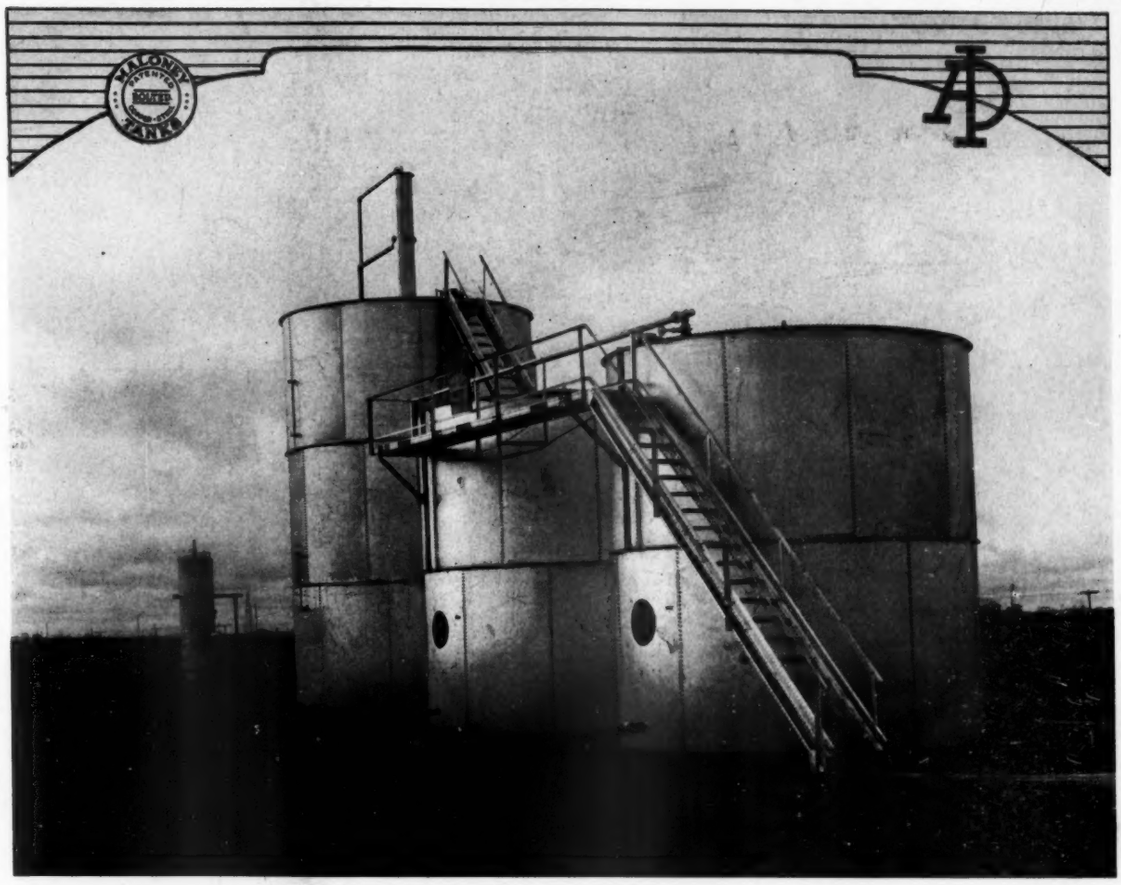

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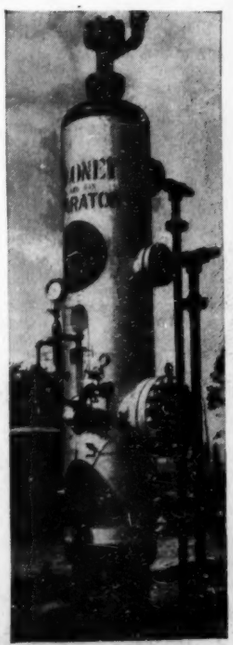

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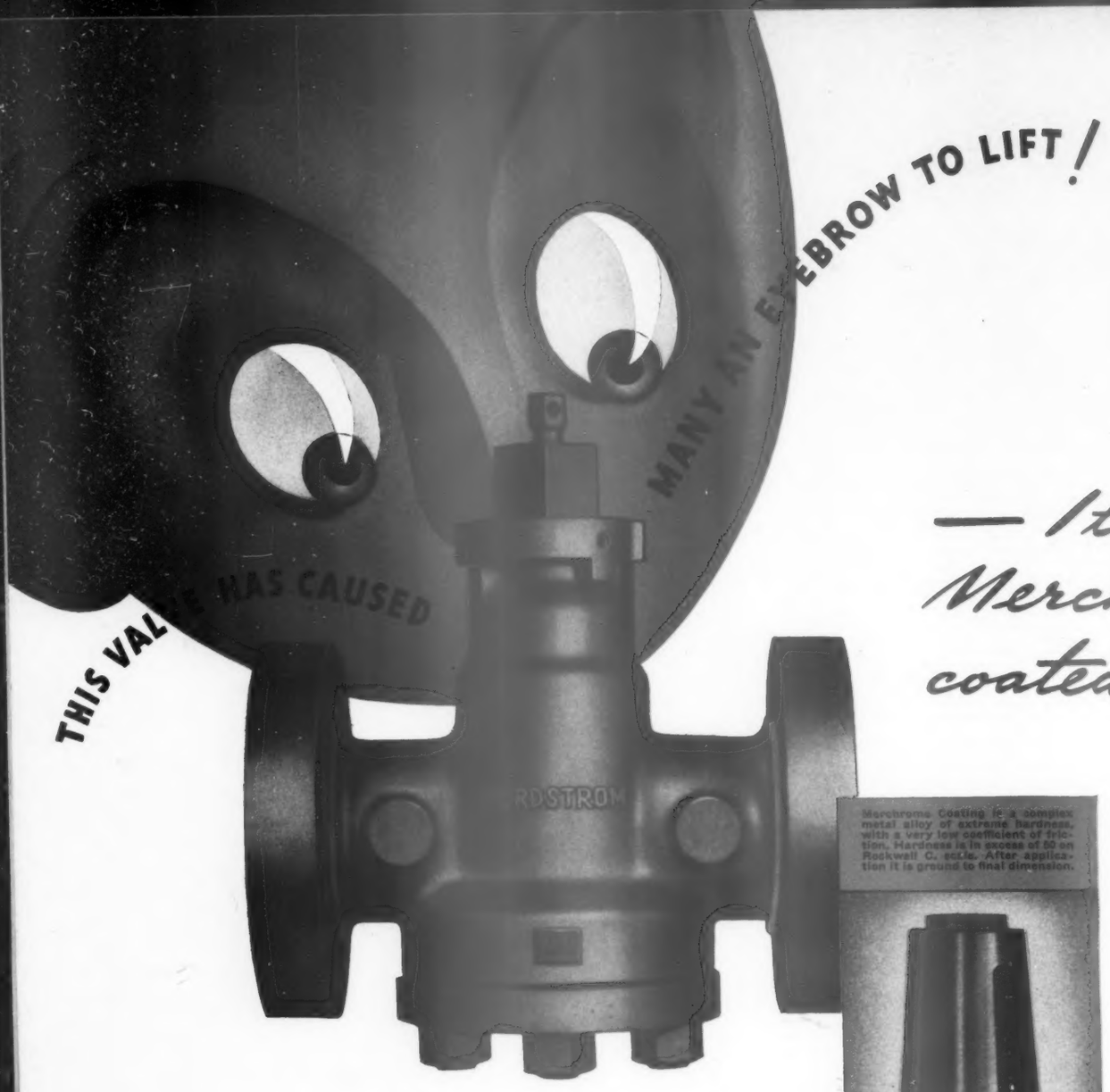

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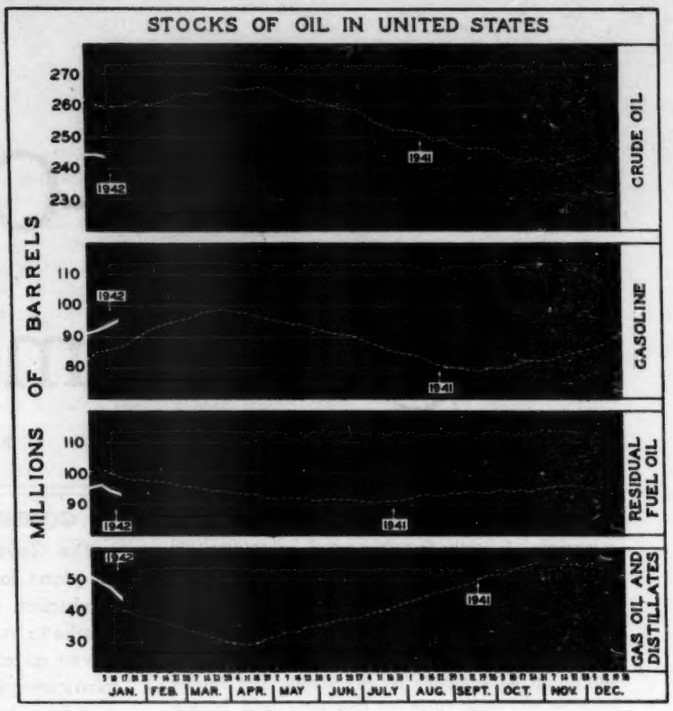
Trends

Changes in Tanker Movement Increase Tank Car Shipments



REPORTS the first of the week showed that the tank-car movement of crude oil and refinery products was rapidly increasing as the result of war developments. It appeared that before the end of the month, rail shipments of crude oil from fields of the Middle West and Southwest to coastal refineries and the movement of products from several refineries, would approach the levels of last fall during the tanker shortage when American boats were turned over to the British. This latest development in transportation is the direct result of attacks on shipping along the Atlantic seaboard including the sinking of 3 oil tankers and also the transfer of 25 additional tankers from Atlantic to Pacific service. It is feared that coastwise shipping between Gulf Coast and Atlantic seaboard points will be crippled so that full use will again have to be made of every available overland shipping facility. It is assumed that tanker shipping along the Atlantic coast will be convoyed as has been the case on the Pacific coast since submarine raids of the enemy ended the normal shipping movements. Shipments by convoy mean that greatly increased tanker capacity is required to maintain normal movement of oil.

CRUDE PRODUCTION *4,044,240 bbl. daily average—down 208,220 bbl. One year ago 3,605,835 bbl.*

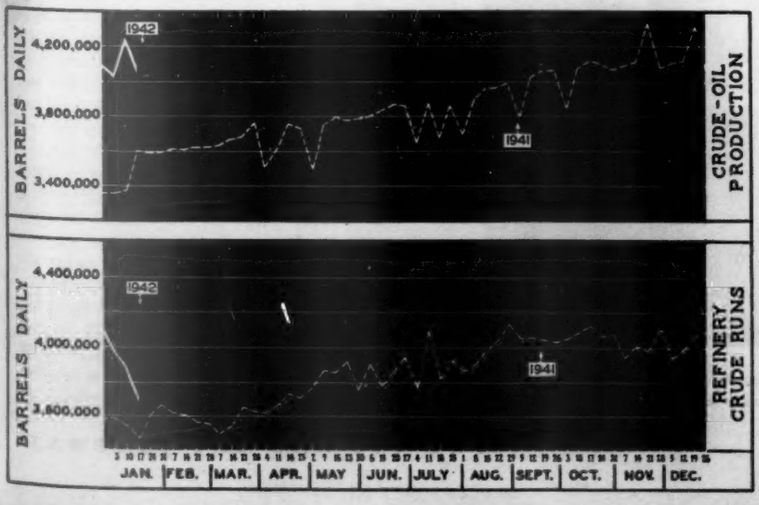
CRUDE STOCKS *244,364,000 bbl. as of January 10—down 76,000 bbl. One year ago 259,942,000 bbl.*

GASOLINE STOCKS *95,617,000 bbl. as of January 17—up 1,413,000 bbl. One year ago 86,929,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *92,703,000 bbl. as of January 17—down 2,182,000 bbl. One year ago 99,292,000 bbl.*

GAS OIL AND DISTILLATES *43,984,000 bbl. as of January 17—down 3,266,000 bbl. One year ago 40,378,000 bbl.*

REFINERY RUNS *3,723,000 bbl. daily week ended January 17—down 168,000 bbl. One year ago 3,471,000 bbl.*



For the week ending January 10, government reports show that the movement of oils to eastern points by tank car averaged 58,725 bbl. daily, a decrease of 60 per cent compared to the high of last summer. Reports indicate increased shipments requested by OPC will pass 100,000 bbl. daily again by the end of this week. The week's most important development has brought a revival of interest in new pipe lines including the projected National Defense line to connect southwestern and Illinois fields with eastern refineries. This project was stopped last fall with the return of a large number of tankers by the British.

DAILY AVERAGE PRODUCTION FOR WEEK

	Jan. 17 1942	January OPC recommended production	January state allowables	Jan. 10, 1942
Arkansas	73,345	73,700	75,689	72,915
California	633,750	646,200	646,200	615,890
Eastern fields	108,900	113,100	.....	111,100
Illinois	337,570	386,400	.....	381,420
Kansas	254,850	259,900	259,900	226,650
Louisiana	361,525	329,300	361,111	361,185
North Louisiana	*81,825*	.....	.....	*82,235*
Louisiana Gulf Coast	*279,700*	.....	.....	*278,950*
Michigan	50,600	47,400	47,400	48,900
Mississippi	72,915	60,400	.....	75,845
Nebraska	5,150	5,600	.....	5,375
New Mexico	120,450	121,200	121,200	118,780
Oklahoma	415,925	415,700	425,000	411,450
Rocky Mountain states	107,460	106,000	.....	108,850
Texas	1,501,800	1,573,500	1,620,659	1,714,100
East Texas	*368,900*	.....	.....	*438,200*
West Texas	*294,500*	.....	.....	*343,800*
North Central Texas	*145,300*	.....	.....	*146,800*
East Central Texas	*88,150*	.....	.....	*93,300*
Texas Panhandle	*87,850*	.....	.....	*91,600*
Texas Gulf Coast	*419,400*	.....	.....	*490,650*
Southwest Texas	*97,700*	.....	.....	*109,750*
Total United States	4,044,240	4,138,400	.....	4,252,460
Total production, Jan. 1-17, 1942		70,166,000 bbl.		
Same period last year		58,117,405 bbl.		

All of the preliminary work in connection with this mammoth line has been completed including an aerial survey and other investigations covering the route of the line. Work on the line could be started, it is said, as soon as contracts are let and materials made available. It is pointed out that in addition to the need for more transportation capacity the vulnerability of coastwise shipping, as revealed over the past few days, will make pipe lines more attractive to those who are directing war policies.

Market reactions to the transportation change are reported. The movement of crude oil and products from Gulf Coast refineries and terminals has slowed down and spot and contract buying is less active. Withdrawals from stocks at East Coast refineries and terminals have been exceptionally heavy during the past 2 weeks. Crude-oil markets in the Illinois basin area are tight.

Rubber, 100-Octane Fuel Need Large Volume of Base Stocks

By W. L. NELSON

THE petroleum industry, including natural-gasoline operations, has enough mixed-butane stocks to supply the 90,000-125,000 bbl. per day of butanes that may be required for the present programs of synthetic rubber and 100-octane fuel manufacture. A nation-wide program will be necessary to make that quantity available. These amounts will not be required if base stocks other than mixed butanes are employed for part of the program. This amount of butane (90,000-125,000 bbl.) will be available by decreasing the butane content of motor fuels by less than half, by absorbing more butane from gases already being processed, and by husbanding the butanes that are available in refineries.

Butane Stocks Available

Conflicting estimates are rife on the amount of butane (and other four-carbon-atom materials) available and of how much is readily available. Complete figures are not forthcoming, but estimates can be made which fix our output within definite ranges. From the total production of natural gas in 1940 (2,660,220 million cubic feet) and from an average total butane content of 2.0 per cent, the barrels per day of butanes in all of our natural gas is 110,000. On this same basis, H. M. Smith of the Bureau of Mines (Information Circular 7108, 1939) would estimate 55,000 to 111,000 bbl. per day. Likewise, "Petroleum and Natural-Gas Production," by the W.P.A. (1939), indicates less than 100,000 bbl. per day. Nevertheless, figures given by G. G. Oberfell, Phillips Petroleum Co., indicate a far greater amount, perhaps more than 200,000 bbl. per day. Inasmuch as all of the gas now being marketed is not passing through gasoline plants (90 per cent being processed according to the W.P.A. report) it would seem that a high figure of the amount of butanes directly available from present gasoline plants (whether now being recovered or not, would be in excess of 94,000 bbl. per day.

Estimates of the butanes that are present in crude oil, refinery gases, cracked gases, etc., can be calculated more closely, and are approximately as follows (1940):

	Total available (b.p.d., est.)	Now being processed (b.p.d., est.)
From natural gas	110,000 (to 200,000)	94,000
From crude oil and still gases	58,000	58,000
From cracked gas and gasoline*	85,000	85,000
	253,000 (to 343,000)	237,000

*The quantity available by present operations.

The difference in these two figures (16,000 or more) is the butanes in field gases not now being passed through gasoline plants.

The amount of butanes now passing through plants (237,000 bbl. per day) is being used somewhat as follows (1940):

	Sold in products	Lost, burned, discarded, etc.
Natural-gasoline plants	45,000	49,000
Petroleum refineries	105,000	26,700
Liquefied petroleum gases	11,300	.....
	161,300	75,700

Breaking these figures down further, the distribution and sources of butane are:

	(b.p.d.)	Possible available butanes (b.p.d.)
In finished motor fuels*	150,000	60,000
In liquefied petroleum gases	11,300	5,000
Sold as products	161,300	
Lost by burning in gasoline plants	17,000	17,000
Lost in residue gases from gasoline plants	32,000	32,000
Lost or burned in refineries	26,700	10,000
In unprocessed lean field gases	16,000 (to 106,000)	5,000
	253,000	129,000

*Includes butanes used by polymerization, etc.

Thus, it would seem possible to lay hands upon a total of 129,000 bbl. per day of butanes without an extensive construction program or without hardship to the public. Considering each of the figures for available butane: 60,000 bbl. from motor fuels by providing less volatility and by a probable decrease in motor-fuel demand during several years, 5,000 bbl. by curtailment of non-essential liquefied-gas sales; 17,000 and 32,000 bbl. by operating natural-gasoline absorbers for total absorption of butanes (none would be in the residue gas that was burned); about 10,000 bbl. by the installation of more recovery systems in small refineries; and possibly 5,000 bbl. by processing more gas or building a few additional natural-gasoline plants. It would seem that cost of connecting up large new areas of lean gas fields for the operation of gasoline plants, or the construction of complete recovery systems in very small refineries would not be justified because of the scarcity of steel. A small amount (perhaps 15,000 bbl.) of butanes (or butenes) could also be produced by the polymerization of cracking-still gases

COMMENT AND QUESTIONS

The Government's announcement of its plans to spend $400,000,000 in the production of 400,000 tons annually of synthetic rubber with petroleum derivatives as a base material, has raised many questions as to how the program can best be carried out and what it means to all branches of the industry. Several phases of the problem are discussed in this article.

Comment regarding this discussion is welcomed and readers are invited to ask questions of the Journal's technical department covering any phase of the rubber development. Starting on Page 41 of this issue Mr. Nelson answers an inquiry regarding the determination of butadiene stock for rubber manufacture.

Emulsification of butadiene with a soap solution and other ingredients resulting in a material with a molecular structure similar to that of natural rubber is carried out in steel vessels under agitation and pressure

such as ethylene and propylene, but the cost would be high.

How Much Butane Is Needed?

The 400,000 tons per year of synthetic rubber called for by Jesse Jones, federal loan administrator, is the weight equivalent of 11,000 bbl. per day of butane. More butanes will, however, be required because it must be converted to butene (or unsaturated hydrocarbons) and in part to butadiene or similar hydrocarbons and finally into synthetic rubber. Just what the losses in this chain of reactions will be cannot be definitely stated but a conservatively large figure would be 45,000 bbl. per day, and it should be noted that the side reaction products would in some degree be useful products. Furthermore, at least part of the synthetic rubber will not be made from butanes or butadiene and hence a top requirement of 35,000 bbl. per day of butanes should suffice.

With the announcement of the plan for 400,000 tons per year of rubber, newspapers referred to the use of 200,000 bbl. per day of crude oil. If such a plan is contemplated, it is obvious that all of the butane enumerated above will not be required. Crude oil can be cracked (decomposed) or can be decomposed and catalytically dehydrogenated into butane and butadiene-type hydrocarbons. Since adequate supplies of butane are, however, available, it would appear to be a needless and wasteful operation to expend our manpower, supplies and time, in building decomposition plants for crude oil when the conversion of butanes would be much more direct. The Universal Oil Products Co. has developed a catalytic dehydrogenation (Ind. Eng. Chem. 32, 268 and 309, 1940) process by which 70-80 per cent of butadiene was produced from butene, or 50-65 per cent of butadiene from butane. Butadiene can be made by other processes which are generally more expensive, and it is also present in the gases from cracking plants in small amounts. The separation, however, of butadiene at all of the numerous cracking plants in the country would probably be enormously wasteful. The production of butadiene (or dienes) in large amounts by decomposition involves the use of extremely high temperatures.

The entire operation of producing rubber will consist of the following general steps (1) accumulation of suitable base stocks such as butanes, cracking stocks, crude oil, etc., (2) decomposition and/or dehydrogenation of these stocks into butanes (or olefin) and butadiene (or dienes), (3) purification of these products, (4) polymerization or condensation operations to produce the rubber, and (5) compounding, shaping and fabrication of the rubber into finished products including vulcanization. Only the first two or three of these operations are in the direct province of the petroleum industry, and the actual rubber-producing operations (3-5) and plants will probably be conducted by rubber manufacturing companies.

The production of 100-octane aviation fuels may be produced by blending the following approximate amounts of stocks:

	Barrels per day
Straightrun naphthas	40,000
Isopentane	30,000
Catalytic and reformed gasoline	30,000
Alkylates and hydrocodimers	30,000- 50,000
Tetraethyl lead	.....
Total, variable	130,000-150,000

Of these, only the 30,000-50,000 bbl. per day of alkylates, isooctane, hydrocodimers, etc., must be made from butane-base stocks. Due, however, to losses, from 50,000 to 80,000 bbl. per day of butane-base stock may be required.

The total requirement for synthetic rubber and aviation fuel thus amounts to 80,000-115,000 bbl. per day of butanes. This is less than the amount of butanes that is available (129,000) but a great effort will be required to obtain such an amount. Should difficulty be encountered in obtaining adequate amounts of butanes, the 80,000 bbl. required for aviation gasoline could be almost entirely eliminated by dropping the octane specification to 90-95.

Large Building Program

The present plans for 100-octane aviation fuel and synthetic-rubber manufacture, according to press accounts or inferences, involve immense construction programs. The specification of 100-octane number that has been required for our aviation fuels is just high enough to be impossible of fulfillment in existing refinery equipment whereas an octane number of 90-95 would require scarcely any extensive or time-consuming construction work. The requirement of 100 is so high that special alkylation, isooctane or hydrocodimer units must be built.

Similarly, in connection with synthetic rubber, it begins to appear that vast plants are being contemplated, involving the processing of 200,000 bbl. per day of crude oil for the production of 15,000 to 25,000 bbl. per day of butene, butadiene, etc., which will be finished into the equivalent of 11,000 bbl. of rubber. The exact methods of rubber manufacture that will be employed have not been disclosed and hence a complete evaluation of the need of processing 200,000 bbl. of crude oil per day cannot be made. If, however, butenes and butadiene-like hydrocarbons are finally to be employed, it would seem that our natural-gasoline and refining plants would be the common-sense place to obtain the butanes.

Reclamation Urged As Relief From Rubber Shortage

NEW YORK, Jan. 19.—Tire manufacturers and distributors in the United States had around 11,000,000 casings in inventory when the federal order was issued prohibiting further sales, except on a rigid rationing system. Total stocks represented less than a fifth of the production in 1939 and 1940 and less than a sixth of the accelerated rate of manufacture that prevailed during the first 11 months of last year.

Stocks of raw rubber in the United States totaled 454,711 tons at the end of last October which, at the average of 19 lb. consumed in the manufacture of each tire was sufficient to make 53,600,000 casings if applied exclusively to this service.

Rubber-producing countries of the world shipped 1,389,695 long tons of crude latex during 1940, the latest year for which complete data are available. South and Central American countries supplied only 21,707 tons. Remainder was exported by countries in Asia, Netherlands East Indies, and Africa.

The United States imported 818,624 tons in 1940, indicating that more than 58 per cent of the world's rubber production was consumed in this country, added to stocks or manufactured and re-exported in finished commodities.

Since imposition of the rubber rationing system, attention of manufacturers and consumers has turned to reclamation as a source for relief until other arrangements can be made. Production of reclaimed rubber in 1940 totaled 208,971 tons, consumption was 190,244 tons, and stocks totaled 32,636 tons at the end of that year. Operation of reclamation plants was stimulated during 1941, reaching a peak so far reported during October when 26,560 tons were reclaimed, a rate of 320,000 tons annually. Consumption of reclaimed rubber in ratio to raw latex was at the rate of 28.7 per cent in 1939, 29.3 per cent in 1940, and 41.4 per cent through the first 10 months of 1941, indicating that manufacturers are drawing more heavily on this source.

Accompanying tables give some of the pertinent data on world and United States rubber conditions.

SHIPMENTS FROM PRODUCING COUNTRIES, 1940

Malaya Brunei, Labuan	540,417
Netherlands East Indies	536,740
Ceylon	88,894
India	11,510
Burma	9,668
North Borneo	17,623
Sarawak	35,166
Thailand	43,940
French Indo China	64,437
Philippines, Oceania	2,267
Liberia	7,223
Nigeria, British Cameroons	2,903
Other Africa	7,200
South America	17,601
Mexico (Guayule)	4,106
Total	1,389,695

UNITED STATES IMPORTS AND CONSUMPTION

	Imports	Consumption	Stocks*
1939	466,616	592,000	125,800
1940	818,624	648,500	288,864
1941, 10 months	836,208	603,447	454,711

*Stock figures for end of period.

RECLAIMED RUBBER PRODUCTION, USE AND STOCKS

	Production	Consumption	Stocks
1939	186,000	170,000	25,250
1940	208,971	190,244	32,636
1941, 10 months	228,525	212,751	38,604

Peak of 26,560 tons reached in October at rate of 320,000 tons per year.

U. S. TIRE PRODUCTION, SHIPMENTS AND STOCKS

	Production	Shipments	Stocks
1939	57,612,731	57,508,775	8,664,505
1940	59,186,423	58,774,437	9,126,528
1941, 11 months	58,562,269	63,558,685	4,042,993

DISTRIBUTORS' TIRE STOCKS

October 1, 1941	6,478,000
July 1, 1941	7,684,000
October 1, 1940	7,270,000

Economists Urge Liberalization Of Some Rubber Restrictions

NEW YORK, Jan. 19.—Proposals made by Norman D. FitzGerald and Joseph E. Pogue of the Chase National Bank's department of petroleum economics for greater use of reclaimed rubber in prolonging the service life of automobile tires were being accorded full consideration this week by manufacturers and federal agencies.

In advocating expansion of the rubber-reclamation program and in urging the Government to liberalize certain restrictions now retarding such a policy, the two economists pointed out that shortages are real but probably not as immediate as popularly apprehended. Idle capacity of rubber reclaiming plants, the analysts believe, is sufficient to increase output of this material for

(Continued on Page 71)

Oil Men Ask Definite Spacing Program to Guide Operations

By H. STANLEY NORMAN

OIL men throughout the country devoted their full attention this week to the task of meshing operations with limitations with Preference Rating Order P-98 and its application to the petroleum industry in relation to Conservation Order M-68.

This outwardly complacent attitude is underlain with dissatisfaction with several provisions of the two basic orders. There has been little to clarify the most perplexing problems. In fact, some of the companies and individual operators are just now realizing the full significance of certain sections of the two orders.

A director of materials for District 2 was appointed early this week indicating that the Chicago office of the OPC is gearing its personnel to handle a larger volume of work dealing with this phase of operations. E. E. (Ned) Robbins, Tulsa, assistant division sales manager of Oil Well Supply Co., was designated. He will report at Chicago January 23. In addition to functioning as the clearing point for orders which must be countersigned by the director for the district in which the equipment is to be used, Mr. Robbins will have other duties related to placing information in OPM.

E. E. ROBBINS

Considerable agitation has developed in Kansas, particularly, but other southwestern oil states as well, for a liberalization or, at least, clarification of the spacing limitations stipulated in Conservation Order M-68. Most operating companies have been unable to determine just how wells should be spaced even on 40-acre tracts to conform to the order.

Recognition of the confusing elements remaining unanswered from Washington was given late last week in Tulsa at a meeting of the District 2 production committee headed by Otto Donnell, chairman of the group and president of the Ohio Oil Co., Findlay, Ohio.

Fear Production Decline

In the discussions within the committee, several members voiced conclusions that the one well to 40-acre program was insufficient in many states to maintain production at current levels. In this connection, it was pointed out that active operations in Illinois have declined from an average of 450 before M-68 order was issued to about 330 at the present time. Production in the state has declined without the benefit of a third of the rigs normally active.

The District 2 production committee specifically recommended that the OPC adopt certain practices that would clarify the operating picture. The committee's statement following the day-long discussion is quoted:

"Recommendations, expressed in resolutions, designed to obtain clarification in terms and procedure of Orders M-68 and P-98, issued January 14 by the Office of Production Management, were formulated by the committee in its meeting January 16. This committee, appointed several months ago by Petroleum Coordinator Harold L. Ickes, devoted the greater part of its meeting to study of the two orders.

"The first of the orders, M-68, directs the use that is to be made of oil-field equipment in drilling and producing. The other, P-98, sets out preference ratings and prescribes methods to be followed by oil operators in obtaining equipment.

"One of the resolutions adopted by the production committee concerned well spacing patterns. Order M-68 directs that, subject to exceptions named, wells are to be drilled on 40-acre locations but it does not say in which portion of the 40-acre location. The committee asked that some method be provided for 'fixing the well-spacing patterns to be observed in drilling and completing wells to comply with the restrictions and limitations' of the order.

"It further recommended that state regulatory bodies of District 2 be authorized to designate by order the spacing patterns to be followed in the field. Specifically it named the following as appropriate agencies to make such spacing designations: Corporation Commission of Oklahoma, Corporation Commission of Kansas, Department of Mines and Minerals of Illinois, Department of Conservation of Michigan, Department of Mines and Minerals of Kentucky, Division of Mines of Ohio, state geologist of Nebraska and such person or persons as the governor of Indiana might designate. The foregoing states are those which produce petroleum in District 2.

Countersigning Rule Deplored

"Another source of great delay in conducting oil-field operations pointed out by the committee was the provision in Order P-98 that the director in charge of the nearest district office of the Office of Petroleum Coordinator must countersign certain purchase orders on materials covered by preference ratings. This provision, said the committee, would force the shutting down of many drilling and producing wells for indefinite periods while the operator was awaiting the signature of the district director, located in many instances, hundreds of miles from the operator's home. Tulsa operators, for example, would have to send or take their purchase orders to Chicago.

"The committee pointed out that another effect of the provision for countersignature of the director would be to cause accumulation of stocks of materials and equipment because of delay in putting them to use thereby preventing conservation of materials and supplies.

"The committee recommended that this provision for endorsement of purchase orders by the district director be stricken from Order P-98.

"A third resolution dealt with pumping wells. Order M-68 said in one section that materials for maintenance and repair were excepted but in another section it seemed to limit the acquiring or use of material to one pumping well to each 10 acres. The committee saw a possible conflict in the two sections further declared that there are thousands of producing wells in District 2 that average more than one well to 10 acres and that if the second section named applied, thousands of wells would have to be shut down because of inability to obtain material and equipment for maintenance and repair of equipment now installed.

"The committee's recommendation was that Order M-68 be amended to provide that no restrictions be placed on acquiring material for maintenance and repair of pumping or other artificial lifting equipment on wells that were being operated by such equipment on or before December 23, date of original issuance of Order M-68.

Eleven Committeemen Concur

"The District 2 production committee consists of 12 members. Eleven were present at the Tulsa meeting. Those attendings were Mr. Donnell; H. B. Fell, Simpson-Fell Oil Co., Ardmore, Okla., vice chairman; Howard Keck, Superior Oil Corp., Evansville, Ind; A. U. McCandless, Mahutska Oil Co., Robinson, Ill.; L. F. McCollum, Carter Oil Co., Tulsa, H. M. McClure, Alma, Mich.; H. N. Pardee, Texas Co., Tulsa; Ralph Pryor, Wichita, Kans.; Clarence T. Smith, Flora, Ill.; Earl D. Wallace, Petroleum Exploration Co., Lexington, Ky.; and A. S. Ritchie, McPherson Drilling Co., Wichita, Kans. K. S. Adams, Phillips Petroleum Co., Bartlesville, was absent."

Wirt Franklin, Ardmore, Okla., director of production and director in charge of District 2, Chicago, attended the Tulsa meeting. He counseled operators to observe provisions of both orders and again pointed out that the OPC is functioning in a friendly attitude with the petroleum industry.

Certain materials which were on order or en route from factories when Conservation Order M-68 was issued are backing up on supply companies who are attempting to determine whether such equipment can be added to inventory for later distribution under limitations of the two orders. Most oil companies had attempted to forecast their supply requirements on the basis that production needs would be greater this year and that a normal volume of drilling would be necessary to achieve that end.

There has been no development to indicate that the OPC has deviated from its original declaration that 30,000 wells will be required this year but previous plans as to where they are to be drilled may undergo sharp adjustment in order to comply with M-68 spacing specifications. A delegation of Kansas officials and operators composed of Andrew Schoeppel, chairman of the Corporation Commission, and two Wichita, Kans., operators, Joe Aylward and A. S. Ritchie, departed for Washington, D. C., where they will present a protest against the M-68 spacing provisions. Certain Kansas fields, Mr. Schoeppel explained before leaving, did not lend themselves to 40-acre development programs and there was doubt that adequate drainage could be effected without closer drilling.

PRIORITIES.

OPM Representatives Give Answers to Some Questions Which Have Confused Oil Operators

QUESTION: There are six wells drilled on 20-acre spacing on a 160-acre lease. Can the next well be drilled on one of the remaining 20-acre plots or must it be drilled in the center of the 40 acres?

ANSWER: The well can be drilled on one of the 20-acre plots without application to OPC for an exemption. Actually, the proper thing to do would be to apply for permission to drill the second well on the remaining 20-acre location and complete the drainage pattern in the field. Such permission would probably be granted.

QUESTION: We are a company furnishing service and equipment for new wells but are having trouble maintaining stocks. What escape is open?

ANSWER: Use P-98 for service, P-83 for supplies.

QUESTION: Is there an order by OPM governing the price of second-hand oil-field equipment?

ANSWER: Prices do not come under OPM. This is the province of the price administrator, Leon Henderson.

QUESTION: What restrictions are placed on the supply houses as to the sale of material?

ANSWER: If the material was not obtained through the use of P-83 there is no restriction and it can be vended without a rating. For material obtained under P-83, a priority rating is necessary and its distribution is governed by M-68 orders and P-98.

QUESTION: Does cordage come under OPM rules?

ANSWER: Yes. Manila fiber is regulated by Order M-36. Manila fiber may be hard to obtain, the situation being the same as rubber, only worse.

QUESTION: Under M-68, can the type of artificial lift be changed?

ANSWER: Yes, if you can get the material. If it is a new installation an exemption must be obtained.

QUESTION: What does "uniform spacing" mean? If a well is drilled in the NE cor. of a 40-acre tract, must the remaining wells in the quarter section, or the section, be drilled in the NE corners of the 40-acre tracts?

ANSWER: Wells already drilled will have some influence in any development program. Actually the action after December 23, the effective date of M-68 is what counts. The OPC is also working out spacing plans.

QUESTION: Can I obtain a new unit for a pumping well on 10-acre spacing?

ANSWER: The present unit can be repaired. Exceptions will be granted in some cases.

QUESTION: There are already two wells on 40 acres but there are four producing sands. Will permission be granted to deepen one of these wells and drill two additional wells all to different sands?

ANSWER: The order now reads one well to each 40 surface acres. A permit will be needed from OPC to either deepen or drill new wells.

QUESTION: Will tires for tool pushers and superintendents be available?

ANSWER: The rubber situation is going to be tough. The answer is hard to determine, but preferential treatment for necessary services by the petroleum industry is promised.

QUESTION: On what form should we apply for an exemption to complete a gas input well on a repressuring project?

ANSWER: Use provisions in P-98.

QUESTION: What is going to be done with fields already partially developed on 10-acre spacing?

ANSWER: Operators should agree as to the proper plan for the remainder of the development and then make an application for the entire field to be exempted from the regulation of M-68. If the application is warranted, the exemption will be granted.

QUESTION: At the A.P.I. meeting at San Francisco you (James Hughes, head of OPM's Petroleum Division) said that it would be necessary to drill 30,000 wells in 1942. What is your present estimate?

ANSWER: It is still 30,000 wells at this time. This may change next week as it may be necessary to cut this number. Actually, we are moving rapidly toward the reduction in new wells to be drilled.

QUESTION: Does M-68 restrict the use of inventory material on a job started before December 23, 1941?

ANSWER: No. This was clarified in the M-68 amendment last week.

QUESTION: Does P-83 prevent application for higher rating under PD-1.

ANSWER: No. Under the present arrangement form P-82-a should be used.

QUESTION: In a field developed on 25-acre spacing, can alternate locations now be drilled?

ANSWER: Yes. Or an application can be made for an exemption to allow continuation of the development on 25 acres and if the field justifies it, permission will probably be granted.

QUESTION: Does M-68 give a preference rating?

ANSWER: No. It forbids the use of material except in a prescribed manner even when you own it and have it in stock.

QUESTION: Can equipment be sold to a drilling contractor who may later use this machinery in violation of M-68.

ANSWER: It is not the duty of the vendor to prevent the purchaser from using a rig in violation of the law. If the vendor knows that the rig is to be used in violation of the law, he would be liable. On the other hand if the purchaser took the rig and drilled one or two wells without violating M-68 and then drilled additional wells in violation of the order, it would be hard to claim the seller had previous knowledge of the intent and was a party to the violation.

QUESTION: Does second-hand material come under M-68?

ANSWER: Yes. M-68 is an order prohibiting use of equipment for other than specified purposes. New, second-hand and equipment in stock are included.

QUESTION: I have heard that it is now necessary to have purchase orders issued under provisions of P-98 countersigned by nearest district office of the OPC. Where are those offices for Mid-Continent and southwestern states?

ANSWER: For the Mid-Continent, District 2, send orders to Wirt Franklin, 120 South La Salle Street, Chicago; for southwestern states, District 3, to the Office of Petroleum Coordinator, Esperson Building, Houston, Tex.

NEXT WEEK

Outlook and Review Number

This issue will present a detailed review of the present status of the oil industry and will show what is expected of it in 1942 if the nation's predominance is to be continued.

The appraisal of the country's proven reserves will be presented in detail so as to indicate the part that discoveries of new fields, new sands, extensions and improved technique play in maintaining our available supply. Production statistics will be presented covering the past 5 years so that the trend of production in every area can be traced.

Many of the industry's leaders have contributed their views regarding the primary objectives of the oil industry toward winning the war and maintaining the nation's oil supremacy.

Drilling, production, refinery activity, transportation, markets are discussed with particular reference to the needs of the current emergency.

More than ever before, knowledge of the foundation upon which the industry is built is essential to wise planning of future activity. The Oil and Gas Journal's Annual Number concisely and authoritatively presents the facts as they are today.

Henderson Clarifies Policy of OPA on Oil Price Ceiling

WASHINGTON, D. C., Jan. 20—Enunciations of the Office of Price Administration establishing postings in effect November 7, 1941, as the basic ceiling for petroleum, above which advances may not be made without first securing approval of the federal agency, were reaffirmed and clarified in a formal statement today.

Policies of the OPA regarding crude-oil and petroleum-product prices were previously declared by Leon Henderson, price administrator, in letters of November 7, 10 and 28, 1941. The more specific price statement was made today, Mr. Henderson said, as a result of various comments and suggestions made to his office.

"It should be understood," Mr. Henderson cautioned, "that this does not mean that the prices of petroleum and petroleum products which prevailed on November 7, 1941, have received the approval of this office. Such approval or disapproval must necessarily await the investigations now being made by this office into crude production, refining, marketing and other costs and prices."

Text of the OPA's petroleum-price policy follows:

Price Basis

The intent of this request is that future transactions in petroleum and petroleum products shall be made at prices no higher than the prices at which sales of products of equal quality would have been made if they had been concluded on November 7. The types of prices shown below may, after the usual discounts such as those for quantity, prompt payment, or ease of handling, be considered to be the prices in effect on that date, and the maximum prices for purposes of compliance with this request.

Whenever prices are fixed or approved by this office, such prices shall be considered the maximum prices for purposes of compliance with this request.

Spot transactions.

(*a*) Prices contained in price schedules used by a seller and in force on November 7, 1941, shall be the maximum prices on all subsequent sales made by that seller, provided such prices do not exceed those regularly posted or quoted for products of substantially similar quality. Copies of all such schedules shall be filed with this office.

(*b*) In cases where sellers did not have price schedules in effect on November 7, but where regularly posted or quoted prices were published in the first issues on or after that date of The Oil and Gas Journal, National Petroleum News, Platt's Oilgram, or the Chicago Journal of Commerce, or other publications acceptable to this office, the lowest price so published for each product in each market shall be the maximum price for subsequent sales of that product in that market by each seller.

(*c*) If there is a difference between a scheduled price and a regularly posted or quoted price, the lower price shall be the maximum price.

(*d*) In cases where maximum prices cannot be determined on either of the bases described in (*a*) and (*b*) above, each seller shall compute the weighted average price received by him on spot sales of each product in each market during the period October 1 to November 7, 1941, inclusive, and such weighted average prices shall be the maximum price on subsequent sales by that seller of like products in like markets. Such sellers shall file with this office a detailed statement giving the quantities and prices entering into the computation of the weighted average.

Contract transactions.

(*e*) On all contracts calling for the delivery of petroleum or its products which were in effect on November 7, no payment shall be received for delivery of any product which will exceed the maximum prices for "Spot Transactions," unless approved by this office. Contracts may be rewritten, or new contracts written, at prices not exceeding maximum prices for "Spot Transactions." However, attention is called to Section 8 of this letter.

Crude-oil transactions.

(*f*) The maximum price for crude-oil purchases shall be considered to be the posted or prevailing purchase price as of October 1, 1941, except where revisions have been approved by this office. No premiums or other special allowances tending to increase the posted or prevailing price shall be paid without the approval of this office.

Price Coverage

Prices subject to this request shall include all domestic, export and import transactions, sales, transfers, exchanges or purchases of petroleum and petroleum products involving contract, bid or spot sales of the following nature:

Petroleum products: Cargo, harbor, barge, refinery, terminal, tank car, and tank wagon.

Crude petroleum: Field or well, gathering point, tank farm, and terminal.

Prices charged at retail outlets (service stations, including marine service stations, store accounts, curb side pumps, or other similar type retail outlets) are not formally included in this list. It must be understood, however, that these prices should remain substantially at or below November 7 levels. If they do not, a formal ceiling order will be promulgated placing them under full control.

Products

The following petroleum and petroleum products are subject to this request: Crude petroleum; all grades of gasoline, including natural gasoline and blending naphthas, also special hydrocarbon fractions utilized in the manufacture of gasoline or the components thereof; liquefied petroleum gases; tractor distillates and similar distillate-type motor fuels other than gasoline; kerosene, including range oil or stove oil; distillate, burning, heating, or fuel oils; diesel fuel oils; residual burning, heating, or fuel oils; asphalts, including emulsions, road oils, and other asphaltic derivatives; and lubricating oils, including motor, aviation and stock oils (neutrals, bright stocks, steam refined stock and other stock oils).

Industrial lubricating oils, industrial naphthas and solvents, greases, specialty products (such as household oils and spot removers) are for the time being excluded from the list of petroleum products subject to this statement. It is the desire of this office that prices of these products remain substantially at or below November 7 levels. Unless they so remain it will be necessary to place these products under rigid price control.

Persons or Companies Subject to This Statement

This statement applies to all producers, refiners, marketers, and others who buy, sell, or exchange petroleum or petroleum products and includes the following subdivisions as well as any person, persons, companies, or corporations selling or trading in petroleum or petroleum products not specifically mentioned or coming within any of the classifications listed below (with the exception of retail service stations and other retail outlets):

Crude-oil producers, crude-oil purchasers, refiners, pipe-line companies, crude-oil purchasing companies, marketers, integrated companies, nonintegrated companies, terminal operators, distributors, jobbers, and peddlers.

Procedure to Be Followed in Applying for Permission to Increase Prices Because of Increased Costs

Any proposed increase in petroleum or petroleum-product prices, based upon a stated increase in costs, must be approved by this office after study and analysis of the data presented to support the requested increase. Suggestions as to the type of data that are ordinarily considered necessary by this office in considering an application for an increase are shown in Appendix A attached to this statement.

In emergency cases, if it is shown that the furnishing of complete data as suggested in Appendix A is impracticable, or unduly burdensome, consultation with this office is invited for the purpose of determining the type of data and method of handling required to effect prompt decision.

Procedure to Be Followed in Applying for Permission to Adjust Subnormal Prices

Any proposed adjustment of petroleum or petroleum-product prices stated to have been abnormally low or subnormal must be approved by the Office of Price Administration.

Applications for price increases or adjustments under this paragraph must be supported by the following data:

1. Price history from January 1, 1940, to date, or such additional period necessary adequately to reflect what the normal price condition would be, showing actual prices, changes, and dates of change.

2. The reasons for considering the price or prices subnormal and a statement of the conditions bringing about the situation, giving details of competitive activities and their effect on the market.

SUPPLIES OF 100-OCTANE GASOLINE TO FUEL THE NATION'S WAR MACHINES, SHOWN HERE IN MIMIC PRACTICE BUT SINCE THEN PLACED IN SIMILAR WAR ACTION IN THE FAR EAST, WERE BOOSTED MORE THAN 40,000 BBL. DAILY BY CONTRACTS BETWEEN THE GOVERNMENT AND REFINING COMPANIES THIS WEEK AND LAST.

This Week...

Sufficient butanes both for the 100-octane and synthetic-rubber programs are available from petroleum and natural-gas operations, an appraisal of such hydrocarbons disclosed.

●

Atlantic and Pacific Coast oil companies were reenlisted in the use of railroad tank cars to the maximum extent. The OPC wants products made available to consumers. War exigencies are reducing tankers available to civilian service.

●

Railroads moved 58,725 bbl. of petroleum daily into Atlantic seaboard territory. Rail traffic hit a peak of 143,000 bbl. daily last fall.

●

Forty tankers have been ordered transferred from the East Coast to the Pacific—15 in December and 25 last week. Purposes are to relieve Pacific Northwest, augment petroleum supplies at Hawaii and Australia, offset losses in the Netherlands East Indies and as protection against possible attack on Panama Canal.

●

Oil companies whose tire business grew abreast of gasoline sales in peacetime are considering installation of recapping and retreading facilities both for customers' and their own rolling stock.

●

Petroleum stocks on the East Coast declined 2,291,000 bbl. in week ended January 10, reflecting transportation conditions, heavy consumption of fuels.

●

Contracts negotiated by the Government will increase production of 100-octane gasoline by more than 40,000 bbl. daily, at a cost probably exceeding $100,000,000. National production will be about 85,000 to 90,000 bbl. daily when newly contracted plants are completed. More negotiations between refiners and Government are under way.

●

OPM called for pooling of patents, resources, experience and technical skills to assure success of the 400,000-ton synthetic-rubber program. Cost estimates remain at $400,000,000.

●

Member of District 2's production committee called for elimination of P-98 requirement that purchase orders be countersigned by director in charge of nearest OPC district office. Claimed the method cumbersome and source of avoidable delays.

●

Leon Henderson, administrator of the OPA, restated and clarified action placing ceiling on petroleum prices as of November 7. Said the policy stands until nationwide survey, now under way, is completed.

●

Oil regulatory bodies, including state commissions and the interstate compact, are designating representatives to a new National Council of Petroleum Regulatory Authorities, at invitation of Coordinator Ickes. Out of it may come more specific instructions of spacing.

●

Three tankers, one American and two friendly-flag vessels, sunk along the eastern coastline, amplifying vulnerability of water-transported oil moving from the Gulf to northern ports. Unofficial discussions of pipe line to New York revived as solution to menace.

●

Formal order pegging Bunker C and No. 6 fuel prices at levels prevailing January 9 was issued Tuesday by the OPA. Edict displaces what was previously a request not to advance quotations. Range is 85 cents on Gulf Coast to top of $1.55 at Albany, N. Y.

Price Changes for Which Prior Approval Is Not Required

1. Prices may fluctuate below those prices prevailing on November 7 or prices approved by this office. However, notification of such changes will be appreciated.

2. When a price increase has been approved for a certain product or products in a given marketing territory, adequate publicity will be given such action so that all competitive marketers or sellers of that item or items in the same marketing territory may increase their prices accordingly without obtaining approval by this office.

Changes in Marketing Practices and Terms of Contracts, and in Specifications Or Quality of Products

The Office of Production Administration is aware that changes in marketing practices, in the terms of contracts and in the quality of products, can have the same inflationary effects as increases in prices.

Where there has been a change in the quality of the product so that it is identical or substantially identical in character with another which was sold at a differential or lower price on November 7, then the new product should sell at a price no higher than the price for which such other product was sold.

Where there was no posting or price schedule as of November 7 for the product of reduced quality, this office reserves the right to order a reduction in the price based upon the change in quality and other relevant factors.

Changes of this type referred to in this section will be carefully scrutinized by this office in connection with applications for price adjustments and increases and in determining our policy with regard to approval or disapproval of prices prevailing on November 7, 1941.

Handling of Applications

The Office of Price Administration will make every effort to give prompt decisions on applications for price increases, provided such applications are accompanied by complete and adequate data to support the necessity for the proposed increase. It is requested that applications for price increases be presented as far in advance as possible in order to give a reasonable time for analysis of the applications and for obtaining any additional information required. In submitting applications for price increases, any additional pertinent data which will serve to clarify and support the proposal will be appreciated.

General Comments

The Office of Price Administration will welcome any suggestions and criticisms which members of the industry think may be of assistance in handling of these matters. The continued cooperation of the industry is greatly appreciated.

Appendix

Type of data ordinarily deemed necessary by the Office of Price Administration in considering an application for an increase covered under Section V—Procedure to be followed in applying for permission to increase prices because of increased costs:

1. Price history of the products on which increases are proposed from January 1, 1940, to date, or such additional period necessary adequately to reflect market or other conditions, showing actual prices, changes, and dates of change.

2. Statements should be submitted for the months of January, April, July, and October in the periods indicated in (1) above, showing total and overall unit costs, sales realizations and giving the reasons for any increased costs, together with complete supporting data to indicate how costs were calculated.

In general, cost calculations should be made in accordance with accepted principles of cost accounting and should show all the principal items of expense, distinguishing between direct expenses such as wages and materials and indirect or overhead charges such as depreciation, insurance and general administrative expenses. The exact form in which the data are to be submitted is for the time being left to the discretion of those subject to this request, but those who initiate proposals for price increases must show by comparison of total and unit gross realizations, gross margins and costs, that the increase is justified.

Whenever data have already been submitted to the Government, it will not be necessary to duplicate such data. Reference should be made to the agency and person to whom the data were submitted.

With respect to different types of sellers, the following suggestions are made:

(*a*) *Crude-oil producers* should state such data on schedules comparable to the petroleum inves-

(Continued on Page 22)

STATE CAPITALS...

ILLINOIS

ILLINOIS' 3 per cent oil-production tax law is a "valid legislative document," Atty. Gen. George F. Barrett declared in an answer filed January 15 in Sangamon County Circuit Court to 31 suits challenging constitutionality of the measure.

Counsel for plaintiff firms, which includes practically all key operators in the Illinois oil basin, announced January 16 that a meeting will be held in 2 weeks with members of the attorney general's staff to designate certain suits as "test cases" in order to conclude the litigation as soon as possible.

Pending final court action, approximately $425,000 has been deposited monthly in a protest fund in the state treasury. Plaintiffs are continuing to meet accredited monthly payments.

Circuit Judge Lawrence E. Stone reportedly has pressed the attorney general for prompt action in the case. The state did not file its first answer until January 15, the last filing date allowed under rules of Illinois court procedure in such litigation. Counsel for the oil companies believe that final action in the case, notwithstanding an agreement that may be reached soon on "test cases," will not be taken before April 1.

INDIANA

SECOND MEETING of the seven-man committee representing Indiana's oil industry is scheduled to meet in Indianapolis on Monday, January 26, to consider methods of curtailing the state's production in accordance with requests of the OPC. The committee met last week and recommended that the state conservation department compile data on state oil production by leases and pools in order to arrive at a basis for limiting production if that is necessary under the February OPC quota.

The group agreed during its last meeting that no curtailment would be required this month to meet the 17,300-bbl. daily quota because of weather conditions and federal restrictions on drilling.

MISSISSIPPI

A NEW CONSERVATION LAW was proposed by the conservation committees of both houses of the state legislature last week. The committees asked Atty. Gen. Greek L. Rice to prepare a general oil and gas conservation law to replace one which Mr. Rice said had been outmoded. When the present law was passed, he said, there was no oil in the state, only gas.

MICHIGAN

STATE-WIDE public hearing has been called in Lansing January 27 for a discussion of proration regulations and well spacing. P. J. Hoffmaster, state conservation officer, will preside at the meeting at which views of operators are solicited on establishment of drilling patterns that will conform with provisions of Conservation Order M-68.

Proposals have been made for drilling on the old 20-acre pattern but leaving one of the locations blank so that, if desirable, the vacant acreage may be developed later or after the necessity for conserving materials is terminated.

TEXAS

INCREASES OF 165 per cent in the daily allowable production of discovery wells in Texas and extension of the special-dispensation period to a total of 6 months instead of 4 as previously allowed becomes effective February 1.

Revision in the allowable policy pertaining to new wells in undeveloped areas was established to encourage exploratory drilling and the discovery of new reserves.

Allowables assigned to discovery wells may be adjusted downward if more than five wells are completed before the maximum allowable period of 6 months has expired.

Authorized production from new discoveries is graduated on a depth scale. The following table shows the present allowable for discovery wells and that authorized effective February 1:

Depth in feet—	Present allowable (bbl. dly.)	February 1 allowable (bbl. dly.)
0- 1,000	15	40
1,000- 2,000	30	80
2,000- 3,000	45	120
3,000- 4,000	60	160
4,000- 5,000	75	200
5,000- 6,000	90	240
6,000- 7,000	105	280
7,000- 8,000	120	320
8,000- 9,000	135	360
9,000-10,000	150	400
10,000-11,000	...	440
11,000-12,000	...	480

ASSUMES NEW DUTIES . . .

JAMES NOEL, a native of Pilot Point, Tex., recently assumed duties as head of the oil and gas division of the Texas attorney general's department. He has been a member of the attorney general's staff since 1939, serving 3 years in the land division as a trial lawyer. He prosecuted the state suit through which a vacancy strip in the Hastings field, Brazoria County, was adjudged property of Texas

Ickes Announces Formation of National Conference of Petroleum Regulatory Authorities

WASHINGTON, D. C.—Formation of a National Conference of Petroleum Regulatory Authorities to "provide for the fullest cooperation between the federal Government and the oil-producing states in the work of petroleum coordination," was announced Saturday by Petroleum Coordinator Harold L. Ickes.

The conference will be composed of members representing the Interstate Oil Compact Commission, and those oil states having official agencies charged with the regulation and conservation of oil and gas production.

Telegrams requesting the designation of a representative to serve on the conference have been sent to Gov. Leon Phillips, of Oklahoma, chairman of the Compact Commission, and to the "appropriate officials" of the following states:

Arkansas, Colorado, Illinois, Indiana, Kansas, Louisiana, Michigan, Mississippi, Montana, New Mexico, New York, Oklahoma, Pennsylvania, Texas and Wyoming.

"It is contemplated," Mr. Ickes said, "that this National Conference of Petroleum Regulatory Authorities will hold regular meetings in Washington to consider the many petroleum problems that directly affect the production and conservation policies of the various states."

A date for the first meeting will be set when the list of members of the conference is completed, Mr. Ickes said.

Deputy Petroleum Coordinator Ralph K. Davies said that among the various problems which will come before the conference is that of increasing production from those oil fields which yield the types of crude necessary for the manufacture of 100-octane and other aviation gasolines. Production problems with respect to the petroleum required for the new 400,000-ton synthetic rubber program also will be considered by the conference. These problems, Mr. Davies explained, will be studied in the light of their effect on production from fields which yield lower-grade crude and on state conservation and other policies.

States Name Representatives To National Council

Three states had responded last week to the request of Petroleum Coordinator Harold L. Ickes that oil-producing states appoint representatives to the National Council of Regulatory Commissioners. A majority of the members of the Railroad Commission designated Jerry Sadler, member of the commission, to represent Texas. Governor James named Parker L. Melvin, Bradford oil operator, for Pennsylvania; and Oklahoma's Corporation Commission named its chairman, Reford Bond.

The OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

P-98

Three weeks ago this column, in commenting on General Preference Order M-68, explained "there is nothing in the orders so far issued indicating the petroleum coordinator has in mind major revisions in the industry's operating practices." In the light of what has since happened, many, with sufficient reasons, might question the exactness of that observation.

The wording of the OPM order, made on the recommendation of the Office of Petroleum Coordinator, and the series of events which preceded it were certainly susceptible of the interpretation that the Government's agencies, while establishing certain conservation rules, did not intend to outlaw a large number of production practices. It is around these operations that the industry has been expanded and they account for the fact that Washington's numerous war worries do not include a lack of crude-oil supplies.

It is difficult to correlate some of the rules of procedure and the interpretations of the more recent order P-98 in relation to the broad and flexible provisions of M-68. While termed companion orders, with the one implementing the other, it is now apparent that the two conflict in several respects.

The first order established conservation rules designed to guide the producing branch of the industry in assuring adequate oil supplies for civilian and war requirements with the minimum use of materials. The second order, through delays and rigid interpretations, threatens to defeat the primary objectives of the first.

If it is not revised, P-98 will bog down of its own weight. It does not provide the procedure and machinery for prompt action in new operations which normally bring requests for 100 drilling permits every working day. Better coordination between the Washington and district offices of OPC is mandatory. The establishment of field offices within the districts may be necessary.

It is also apparent that the rules governing the granting of exceptions to the well-spacing and producing program will work a special hardship on small operators. These producers cannot obtain, except at heavy expense, the information which the Government says it must have before applications for exceptions will be considered.

Then there are the dangers inherent in disrupting employment in drilling and other field operations. Only those who have the responsibility of direction can visualize what will happen if several thousand drilling employes are thrown out of employment due to conditions brought about by delays in applying new regulations or through an erroneous conception of what is required to maintain or expand present production.

These field men are a vigorous breed and, out of work, will leave the oil country for other employment. Shortly, when a return to normal operations will be necessary, drilling contractors and oil companies will be confronted with the problem of resuming full scale operations minus the trained personnel.

Hundreds of varied operations which yearly find many new fields and which carry on a steady development in existing fields, are threatened. Impetus will be given to the junking of drilling and production equipment whose owners cannot tide over an idle period.

While P-98 gives exploratory operations a strong priority position, the enforcement of the entire program will mean that many producers will not be able to obtain the financial support necessary to find new fields.

The agencies of Government, in their desire to conserve equipment and enforce their particular concepts of what field practices should be, are in danger of weakening the oil structure—now in sound condition—at its base. Operators must not hesitate in taking action in this matter of immediate and long-range importance to a large fraction of the world's population now allied in war.

East Coast Supply Situation Again Imperiled Due to Transfer of Tankers

By J. P. O'DONNELL

NEW YORK, Jan. 19.—Possible recurrence of the critical East Coast supply situation which the industry met so successfully last fall is seen as the result of several developments during the past week. A summary of these developments follows:

1. Announcement of a plan to transfer 40 tankers from the Atlantic to the Pacific.

2. The accelerated decline in stocks of crude and refined oil on the East Coast.

3. Continued increase in the volume of petroleum being moved to the East Coast by tank car.

4. The sinking of two tankers off New York last week, presumably both by enemy submarines.

5. Beginning of a petroleum barging survey looking to maximum utilization of present facilities.

Whether or not this situation will reach a critical stage may depend largely on the effect of tire rationing. The Office of Petroleum Coordinator has estimated that it will result in a 35 per cent reduction in motor-fuel consumption. Since motor fuel, on the basis of reports for the first 11 months of 1941, constitutes 35 per cent of the crude and refined oil transported by tanker from gulf to North Atlantic ports a reduction of the magnitude estimated would have the immediate effect of releasing better than 12 per cent of the fleet normally engaged in this service. However, the OPC prediction is not shared entirely by the industry in which predictions varying from an 8 per cent decrease to a 7.5 per cent increase in 1942 gasoline demand have been voiced.

Tanker owners have been notified to transfer 40 tankers from the Atlantic to the Pacific, according to the announcement. Fifteen have already been transferred and, it is believed, the remaining 25 will follow as soon as they have completed trips in which they are now engaged. Since 40 tankers would be equivalent to the number returned to domestic service after being used in the British shuttle service, this would return the East Coast supply problem to the same status experienced when the British service was at its peak.

Pacific Movement Slower

Tankers are needed in the Pacific as the result of the inauguration of convoying and also to supply distant military bases. The use of the convoy system has slowed down deliveries but has been necessitated by the activity of Axis submarines in Pacific waters. Last week two foreign-flag tankers were reported sunk off the North Atlantic Coast, one of which was definitely credited to a Nazi submarine. This may lead to the use of convoys along the Atlantic Coast as well as on the Pacific. In the event such a development is necessitated, deliveries from the gulf to North Atlantic ports will be slowed up also.

That the tightening tanker situation is already being felt is indicated by reports of East Coast inventories. They dropped from a total of 82,034,000 bbl. on November 29 to 72,509,000 bbl. on January 10, a total of 9,525,000 bbl. in 6 weeks. During this period withdrawals averaged close to 1,600,000 bbl. per week. The withdrawals were heaviest in the last 2 weeks for which figures are available when they totaled almost 5,000,000 bbl., an average of 2,500,000 bbl. per week. In contrast to this rapid rate of reduction, stocks declined only an average of 500,000 bbl. per week through December 1940, and January 1941. These stocks include both crude oil and refined products.

Companies Urged To Use More Tank Cars

WASHINGTON, D. C., Jan. 19—Deputy Coordinator Davies today telegraphed two groups of major companies asking them to make greater use of railroad tank cars in moving oil to the Pacific Northwest and the Atlantic seaboard states to build up stocks and make up in part for tankers sunk and transferred to military service.

The West Coast communication was sent to the Texas Co.; Richfield Oil Corp.; General Petroleum Corp.; Standard Oil Co. of California; Tide Water Associated Oil Co.; Shell Oil Co., Inc., and Union Oil Co. It said, in part:

"We are advised that there is tank-car capacity not now utilized, and railroad facilities available to transport substantial quantities of crude oil and products. I fully appreciate tank-car movements will be more expensive than normal movements. However, I am sure you will consider some sacrifice justified in the circumstances. We may later find opportunities for minimizing additional cost through railroad cooperation in matter of special rates and by equitable reimbursement. You are requested to avail yourselves immediately of the opportunity to relieve the situation in this manner."

Sending of the telegrams followed conferences by Officials of the OPC with John J. Pelley, president of the Association of American Railroads, who was asked to furnish information as to tank-car availabilities. On the basis of his report that cars were available, the oil companies were asked to act promptly.

The wire to the 11 eastern companies, which bring oil to this region by rail, also mentioned the question of added cost and promised to bring the matter again before the Office of Price Administration, but added:

"We urge, however, that neither this nor anything else be permitted to delay action such as we are herein calling upon you to take."

The eastern companies to which Mr. Davies' message was addressed are: Gulf Oil Corp.; Standard Oil (New Jersey); Texas Co.; Atlantic Refining Co.; Socony-Vacuum Oil Co., Inc.; Tide Water Associated Oil Co.; Cities Service Co.; Consolidated Oil Corp.; Sun Oil Co.; American Oil Co., and Shell Oil Co., Inc.

Teagle Continues Federal Labor Job

WASHINGTON, D. C., Jan. 19.—At the first meeting of the newly appointed national War Labor Board here, last week, sat one of the outstanding leaders of the oil industry whose career has been notable, among other things, for an unusually progressive and successful policy of employe relations. He was Walter C. Teagle, chairman of the board of Standard Oil Co. (New Jersey) since 1937, and member of the National Defense Mediation Board which was created in March 1940 by President Roosevelt.

Underwood & Underwood

WALTER C. TEAGLE

While serving as a member of the National Defense Board, Mr. Teagle was named to mediate the ship strike in April and he was one of five members of the defense group carried over to serve as a member of the War Board.

Foreign Operating Oil Board Formed

WASHINGTON, D. C., Jan. 16.—Eight top executives of American oil companies engaged in foreign operations have been appointed members of the Foreign Petroleum Operating Board by Vice President Wallace, chairman of the Board of Economic Welfare.

Also created by the Government to maintain adequate petroleum supplies for the United States armed forces and those of the Allies is the Foreign Petroleum Policy Committee composed of representatives of the various federal agencies having a vital interest in foreign oil problems. These agencies are the State, War and Navy departments, the Maritime Commission, the Office of Petroleum Coordinator and the Board of Economic Warfare.

The Foreign Petroleum Operating Board is composed of Robert H. Colley, president of Atlantic Refining Co.; H. D. Collier, president of Standard Oil Co. of California; Col. J. F. Drake, president of Gulf Oil Corp.; W. S. Farish, president of Standard Oil Co. (New Jersey); H. M. Herron, president California-Texas Oil Co., Ltd.; G. S. Walden, chairman of Standard-Vacuum Oil Co.; J. A. Brown, president Socony-Vacuum Oil Co., Inc., and W. S. S. Rodgers, president the Texas Co.

Aviation Demands Will Alter Fuels of the Future

By W. T. ZIEGENHAIN

REFINERY engineers and technologists attending the annual meeting of the Society of Automotive Engineers in Detroit January 12 to 16 discussed the changes that are being made in the manufacture of aviation gasolines under the federal emergency program, but they can also foresee permanent changes coming in ordinary motor-fuel quality. W. M. Holaday and John Happel of Socony-Vacuum Oil Co., Inc., summarized this situation by pointing out that "Research activities are now stimulated by the demand for fuels of higher quality to give greater power, flexibility and operating range to military equipment. The eventual result will probably be the formulation, at a price, of an ultimate gasoline. Even now, such a fuel is theoretically possible from purely scientific considerations. As the art of synthesizing hydrocarbon molecules advances, a gasoline could be made consisting of a blend of pure hydrocarbons, each contributing its own particular characteristics. The result would be a composite fuel of suitable volatility, high power output and low consumption for all superpower demands. Some blending agents of very high quality are already available in reasonably large quantities for aviation-gasoline production. Commercial isooctane, neohexane and isopentane fall into this category. Certain other compounds, notably aromatics, demonstrate important advantages when burned under rich mixture conditions as used for takeoff and fighting operations with highly supercharged aviation engines.

"It is beyond question," Messrs. Holaday and Happel continued, "that further changes in automotive-engine design will be accelerated by wartime activity, and that at least some of the features of aero-engine design will find application in automotive uses. Many of these changes will be for the purpose of obtaining better performance and economy from higher-grade fuels. It is the belief of some engineers that supercharging is the most obvious step in this direction, since the gains from further compression-ratio increases appear to be limited. It would appear of equal importance to develop engine changes to take better advantage of the characteristics of current motor fuels, along the lines of better manifolding, better mixture control and better spark-advance control."

A. W. Herrington, noted designer of both military and civilian motor vehicles, president of the Marmon-Herrington Co., Inc., and newly chosen president of the society, concurred in these views as did C. M. Larson, chief consultant for the Sinclair Refining Co., and newly chosen vice president of the society in charge of passenger-car activity.

S.A.E. ABSTRACTS

Limiting Factors of Overhaul Periods for Aircraft Engines

MARVIN WHITLOCK, Power Plant Engineer, American Airlines, Inc.

The limiting factor to the maximum overhaul period is the volume of the crankpin centrifuged deposit and general lack of cleanliness of the engine. These factors can be alleviated by decreasing the tendency for the oil to form sludge, by decreasing the amount of lead in the lubrication system through improvement in ring sealing and fuel refining and by providing effective filtering facilities in the lubrication system.

1941 C.F.R. Road Detonation Tests: Further Experience With New Methods of Test

(Compiled from report of the Cooperative Fuel Research Committee)

J. M. CAMPBELL, General Motors Research Laboratories
R. J. GREENSHIELDS, Shell Oil Co., Inc.
W. M. HOLADAY, Socony-Vacuum Oil Co., Inc.
C. B. VEAL, Society of Automotive Engineers

To provide some statistics on the service characteristics of current commercial gasolines, each participating organization was asked to determine the octane number-speed characteristics of at least five regular and two premium grades of gasolines. These fuels were to be selected to represent the major quantity of gasoline marketed in the area where each participant was located. Data were reported on a total of 112 regular and 56 premium fuels. By combining these statistics with corresponding octane number-requirement data for a given make of car, the probabilities of detonation in various speed ranges may be estimated. To illustrate the octane number-requirement data were presented on 73 customer cars, as found in service, without adjustment. These cars included 24 Fords, 15 Chevrolets, 13 Plymouths, 7 Buicks, 5 Chryslers, and 9 cars of other make. Of these cars 47 were tested again after adjustment of the initial spark timing to the setting recommended by the manufacturer. Combining the fuel-survey data with the octane number-requirement data, the average regular fuel was shown to operate, without knock, in more than 75 per cent of these cars at 1,000 r.p.m. (approximately 20 m.p.h.) and to be equally satisfactory in more than 90 per cent of the cars at 3,000 r.p.m. (approximately 60 m.p.h.).

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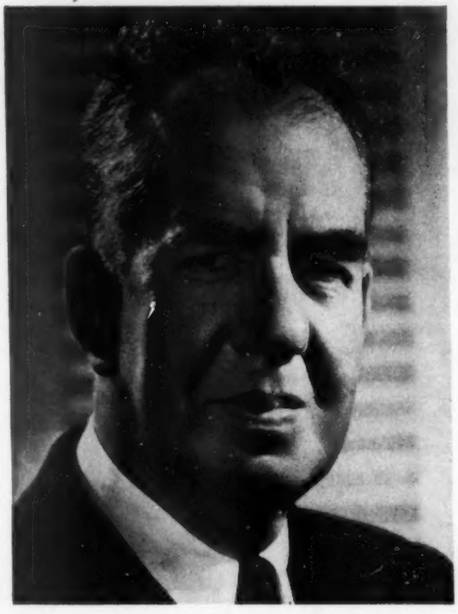
Herrington Elected 1942 President Of Society of Automotive Engineers

A. W. Herrington, president, Marmon-Herrington Co., Inc., Indianapolis, Ind., has been elected president of the Society of Automotive Engineers. Mr. Herrington was born in Coddenham, England, and came to America at the age of 5 years. He received his primary schooling in Madison, N. J., and his technical education at Stevens Institute of Technology, at Hoboken, N. J. His early automotive experience was gained with Harley Davidson Motor Co., Milwaukee, Wis., where he rose to the position of assistant chief engineer. He saw active service with the U. S. Army in the first world war from October 1917 to September 1919. He was discharged as a captain in the Motor Transport Corps. For 10 years, from 1921 until 1931, he was associated with several different motor car, truck and bus companies, and with the U. S. Army and Marine Corps as consulting engineer. He is the designer of several military vehicles.

In March, 1931, Mr. Herrington became associated with the late Walter Marmon, as vice president and chief engineer of the Marmon-Herrington Co., at Indianapolis, in the design and manufacture of high-traction automotive vehicles of all types. On August 27, 1931, Mr. Herrington became president of the company, Mr. Marmon becoming president of the board of directors.



A. W. HERRINGTON

In the 8 years preceding the Munich conference, Mr. Herrington made frequent business trips to Europe and the Near East, where he made first-hand studies of the transport problems of these countries.

It is Mr. Herrington's announced purpose, during the coming year, to use his influence as head of the S.A.E., to help synchronize the efforts of the entire industry into one great force for American defense and the successful prosecution of the war against aggressor nations.

Petroleum Price Index Declines

WASHINGTON, D. C., Jan. 16.—The index of petroleum prices slumped to 60.4, off 1.3 per cent, in the November report of the Bureau of Labor on wholesale-commodity statistics.

With exception of fuel and lighting materials and petroleum, which are closely related, all wholesale indexes increased during November compared with October.

A year ago the petroleum-price index, based on 1926 equaling 100, was reported at 49.3 per cent of parity.

The modest improvement of 0.1 percentage point in the wholesale price of all commodities was due entirely to the relatively poor showing of petroleum and materials classified as fuel and lighting products. Summary of the Bureau of Labor November report follows:

	Index numbers (1926=100)		
	Nov., 1941	Oct., 1941	Nov., 1940
All commodities	92.5	92.4	79.6
Farm products	90.6	90.0	68.2
Foods	89.3	88.9	72.5
Hides and leather products	114.1	112.6	102.3
Textile products	91.1	90.9	74.5
Fuel and lighting materials	78.8	79.6	71.9
Metals and metal products	103.3	103.1	97.6
Building materials	107.5	107.3	98.9
Chemicals and allied products	89.8	89.7	77.5
Housefurnishing goods	100.6	99.5	88.6
Miscellaneous	87.3	86.4	77.5
Petroleum and products	*60.4*	*61.7*	*49.3*

New Contracts Will Increase 100-Octane 35,460 Bbl.

By HENRY D. RALPH

WASHINGTON, D. C., Jan. 19—Capacity of the nation's petroleum refineries to produce 100-octane gasoline will be increased 35,460 bbl. daily when commitments made this and last week by three oil companies and the Defense Supplies Corp. are fulfilled.

A total of five contracts were involved, covering addition of facilities at refineries on the Gulf Coast, East Coast, Pacific Coast and Middle West.

The construction program, most ambitious ever tackled in so short a period by the petroleum refining industry, involves total expenditure of $76,500,000. The three oil companies will supply $49,500,000 of the required capital and the Defense Supplies Corp., subsidiary of the Reconstruction Finance Corp., will furnish the remainder of $27,000,000 to implement the program.

The three companies have agreed to sell their entire output of 100-octane gasoline to Defense Supplies Corp., including 23,050 bbl. daily currently manufactured by their refineries in addition to 35,460 bbl. of daily production that will be available when new facilities are installed and placed on stream.

Meanwhile, the Government announced plans for construction of two plants for production of 100-octane gasoline that will be owned by the Defense Plant Corp. Operation for exclusive account of the Government will be under management contracts with Pure Oil Co. and Southport Petroleum Co. Location and capacity of the plants were withheld for security reasons.

Several other refining companies have accepted preliminary arrangements worked out with the OPC, subject to approval of the DPC, along lines of contracts negotiated with Texas Co., Standard of New Jersey and Magnolia. Ralph K. Davies, deputy petroleum coordinator, predicted that Sun Oil Co., Sinclair Refining Co. and Richfield Oil Co., all of which are proceeding with new plant construction, would offer such contracts to the Government within the next few days.

Texas, Standard and Magnolia

The Texas Co., Standard Oil Co. of New Jersey and Magnolia Petroleum Co. are the three companies committing their entire production of 100-octane gasoline to Defense Supplies Corp., and the new capacity totaling 35,460 bbl. daily will be added at refineries of these concerns at various existing plants.

DSC entered into three contracts with the Texas Co. for the purchase of all 100-octane gasoline produced at the refineries at Port Arthur, Tex., Los Angeles, Calif., and Lockport, Ill. These contracts contemplate that the company will increase its production of 100-octane gasoline from 4,050 bbl. daily, which is present capacity, to 9,510 bbl. per day. Additional plant facilities for this increased production will cost the company approximately $11,500,000, of which DSC will advance $8,500,000 as a loan. The purchase contracts run for 3 years after the new facilities are completed with an option by DSC to extend them for 2 years. The average price of the gasoline, according to terms of the contract, is slightly more than 13.5 cents per gallon.

The contract with Standard of New Jersey contemplates that the company will increase its production from 16,000 bbl. daily, its present capacity, to 37,000 bbl. per day. Additional plant facilities for the increased production will cost the company approximately $50,000,000 of which $14,000,000 will be advanced by the Defense Supplies Corp. to be repaid in gasoline.

The purchase contract runs for a period of 3 years after the facilities are completed, with an option by the government corporation to extend it for an additional 2 years. The gasoline price wil be 13 cents per gallon for the first year, and 12 cents per gallon thereafter.

The contract with Magnolia is similar, but provides for an increase of production from 3,000 to 12,000 bbl. per day. New facilities will cost the company $15,000,000 of which $4,500,000 will be advanced by the Government and paid back in gasoline at 13 cents per gallon. Length of the contract and the 2-year option provision are the same.

Cities Service Makes Contract

In addition, a contract has been made with Cities Service Co. for production of 1,300 bbl. of 100-octane fuel daily.

Refineries of the Texas Co. involved in the federal contract have a total crude capacity of 210,000 bbl. daily and cracking equipment to handle 144,000 bbl. daily. The Los Angeles plant has crude capacity of 37,000 bbl. daily and 11,000 bbl. daily of cracking facilities. Crude capacity of the Lockport plant is 38,000 bbl. daily and the cracking section is rated at 26,000 bbl. per day. One of the largest refineries in the United States is the Texas Co.'s plant at Port Arthur which is rated at 135,000 bbl. of crude daily and 107,000 bbl. of cracking capacity.

Magnolia Petroleum Co. has two active refineries. The Beaumont, Tex., plant has crude capacity of 100,000 bbl. daily and 58,000 bbl. daily for cracking. The Fort Worth, Tex., refinery was increased last year to 20,000 bbl. of crude daily by installation of a combination unit.

Refineries affiliated with Standard Oil Co. of New Jersey include Humble Oil & Refining Co. plants in Texas, Standard Oil Co. of Louisiana's Baton Rouge installation, and Standard of New Jersey's large East Coast setup at Bayway and Bayonne, N. J.

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Industry Asked to Pool Its Rubber Patents and Resources

WASHINGTON, D. C., Jan. 19—The petroleum industry was called upon late last week to pool all patents, resources, experience and technical skills with those of the rubber and chemical industries to assure successful attainment of the new 400,000-ton synthetic-rubber program.

Dr. E. R. Weidlein, chief of the chemicals branch of the Office of Production Management, urging the pooling program, pointed out that many technical difficulties have been avoided by the pooling of patents and technical information.

Enough raw materials are already in sight for the first half of the proposed program, Dr. Weidlein said, and will be provided largely by the chemical industry.

Basic ingredients for the "Buna S" type synthetic rubber adopted as a standard are butadiene and styrene, Dr. Weidlein explained. Butadiene is produced from petroleum, natural gas, alcohol or acetylene. Styrene is a byproduct of the coke industry, coming from benzol. Some 20 other chemicals are used in the production of synthetic rubber, but the quantities used are small and present no large production problems, he added.

The problem of the second 200,000 tons of synthetic capacity, the government chemist said, has been discussed with the petroleum industry, which is studying the matter. The necessary butadiene can be produced as a byproduct in the 100-octane gasoline plants now being constructed to provide aviation gasoline. The butadiene can be extracted, Dr. Weidlein explained, without cutting down the amount af aviation gasoline produced.

●

Explosives Users Must Be Licensed

WASHINGTON, D. C., Jan. 19.—All oil companies, exploration parties, construction crews, and foremen who handle explosives of any kind must now obtain special licenses under the terms of the reenacted federal explosives act.

Regulations under this act were promulgated by the Bureau of Mines and published in the Federal Register January 16.

The law and regulations are very restrictive and carry heavy penalties for violations. The principal objective is to prevent explosives from falling into the hands of enemy aliens and saboteurs, or the use of explosives by persons not qualified to handle them.

Five kinds of licenses are issued: for manufacturers, vendors, purchasers, foremen, and for analysts, educators, inventors and investigators.

Vendor's, purchaser's and foreman's licenses may be obtained for a 25-cent fee from licensing agents being designated by the bureau throughout the country. In most cases these licensing agents are state, county, or city officials, notaries public, or others authorized to administer oaths.

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Buckley Heads Gulf Coast Section of A.I.M.E.

Stuart E. Buckley, Humble Oil & Refining Co., Houston, Tex., was chosen chairman of the Gulf Coast section of the A.I.M.E at its annual election held in connection with the monthly meeting of the section January 13. He succeeds J. U. Teague, Hogg Oil Co. Other new officers are: Vice chairmen, James McKean Bugbee, Baroid Sales Division, National Lead Co., Houston; F. B. Plummer, Bureau of Economic Geology, University of Texas, Austin, and Henry E. Gross, Texas A. & M. College, College Station; secretary-treasurer, Alexander Duessen, geologist, Houston, and directors, Paul Weaver, Gulf Oil Corp., Houston, and Z. W. Bartlett, Freeport Sulphur Co., Freeport.

STUART E. BUCKLEY

The program for the meeting was devoted to the subject of "Fluid Drive." The discussion was led by Carl Anderson, chief engineer, American Well & Prospecting Co., Corsicana, Tex., who pointed out the development of power-driven drilling equipment in the oil industry. Papers on the "Application of the Torque Converter and Hydraulic Transmission to Drilling Operations" were presented by F. J. Whelan, Worthington Pump & Machinery Co., Harrison, N. J., and John B. Jenkins, Twin Disc Clutch Co., Tulsa.

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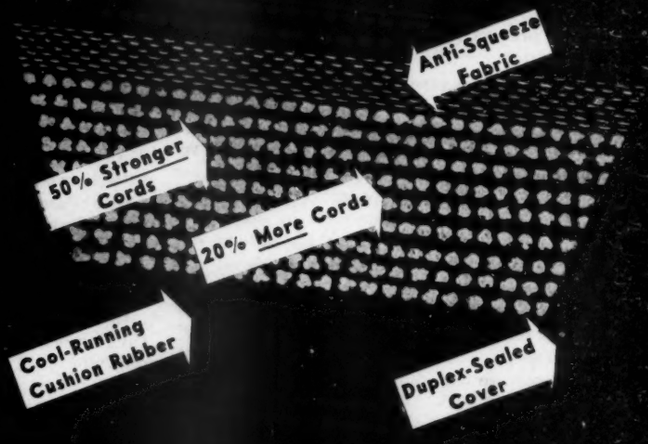

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For here's the newest V-belt line on the market — developed and built for modern high-speed production . . . to give you greater belt pulling strength and longer belt life . . . and add urgently needed efficiency to your machines.

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Henderson Clarifies Policy of OPA on Oil Price Ceiling

(Continued from Page 15)

tigation schedules recently issued by the U. S. Tariff Commission.

(*b*) *Refining companies* who market at wholesale exclusively should submit for the periods indicated in subsection 2 above detailed statements of gross and net realization in total and per barrel of throughput, giving delivered cost of crude-oil purchases, volume of throughput, percentage yields and net refinery operations should also be given, the latter in terms of barrels of throughput. When, however, it is the usual practice of refining companies to compute a unit cost for the principal product by charging all expenses to this product and crediting it with receipts from sales of other products, such a cost statement may also be submitted.

(*c*) *Marketing companies* should submit for the periods indicated in subsection 2 above schedules of overall sales realization in total and per barrel of product sold (*i*) for all their operations (*ii*) for operations in the area in which the price increase is requested. Unit sales realization can be computed by dividing net dollar sales by number of barrels or gallons sold. Where more than one product is sold, the schedule should be detailed to show a breakdown by type of product. Cost of goods sold (which excludes selling expenses) shall be stated in a comparable manner, permitting calculation of total and unit gross margins. The latter schedule should show delivered prices of all products purchased. All other expenses such as selling, delivery, and administration costs should be shown in total and per unit of sales, permitting a comparison of expenses with gross margins and should be detailed to show at least the main items of expense.

(*d*) *Integrated companies* (including refining-marketing companies) are requested to submit a detailed statement of total sales realization and sales realization per barrel for products sold in the marketing area in which the price increase is requested. Cost data shall be submitted in a form that will be comparable to the statement of sales realization for products sold in the marketing area in which the increase is proposed. It is suggested that these data shall show:

(*i*) Refining costs including crude and crude transportation costs in total and per barrel of throughput in the plants supplying the area in question (see 2*b* above). Statement should also show proportion of own crude to purchased crude, if any, the per barrel cost at which crude oil is charged to the refinery and method by which this figure is arrived at.

(*ii*) Transportation costs from the supplying plants to the area in question, with an indication of the mode or modes of transport employed. (See *v* below).

(*iii*) An explanation of the price basing, freight equalization, or other system by which delivered prices are set in the area in question, if delivered prices are quoted.

(*iv*) Marketing costs (including customary allocation of company general overhead) in total and per barrel of products sold in the area in question.

(*v*) Where all or part of the products sold in the area is supplied through an exchange agreement, there should be submitted a statement of the terms of the exchange agreement, prices used and transportation savings effected through such exchange.

Computations showing increases in theoretical "structure prices" will not be sufficient to justify price increases.

3. Statement showing quantity of output and sales by principal products including product or products on which price increases are requested for the periods indicated in (1) above.

4. Comparative profit and loss figures showing earnings per books before and after income taxes, by quarters since January 1, 1940, as well as for the two most recent calendar or other fiscal years, unless such statements have already been furnished by this office.

Thomas Is Chairman of Houston Chapter, A.P.I. Production Division

Bowman Thomas, petroleum engineer for the Humble Oil & Refining Co., was elected chairman of the Houston Chapter of the American Petroleum Institute Production Division at the regular meeting of the chapter at Houston, Tex., Wednesday, January 14. Mr. Thomas succeeds Paul Guarin, Shell Oil Co., Inc. A. W. Baucum, Texas Co., was elected first vice chairman; W. S. Crake, Shell Oil Co., Inc., was elected second vice chairman, and Van D. Bennett of Bethlehem Supply Co. was reelected secretary-treasurer.

BOWMAN THOMAS

E. O. Buck, assistant petroleum coordinator, Division of Production, in District 3; Byron Meredith, Sinclair Prairie Oil Co.; J. U. Teague, Hogg Oil Co.; J. B. Alcorn, Pure Oil Co.; Rex Hamakmer, Reed Roller Bit Co., and Gordon Richmond, Hughes Tool Co., were elected new members of the advisory board.

T. E. Swigart, president of the Shell Pipe Line Corp. delivered a paper on "The Place of Pipe Line Transportation in the Development of the Southwest." This paper is presented in part on Page 45, of this issue. Members of the chapter voted to award a $100 scholarship each year to the most outstanding junior engineer of Rice Institute.

Liquefied Gas Group Cancels Convention

George W. Bach, president, Liquefied Petroleum Gas Association, has announced that a convention of the association, scheduled for February 23-25, at Kansas City, Mo., has been canceled. Mr. Bach said liquefied gas could be converted into aviation gasoline and hence the industry would be too busy for its convention.

DEATHS

H. O. RATCLIFFE, 54, of Gilliland Oil Co., Dallas, Tex., died at his home in Dallas last week after a sudden heart attack. Mr. Ratcliffe was formerly of Shreveport, La., being transferred to Dallas in 1933. His widow survives.

MAURICE A. GRAHAM, 66, retired employe of Hope Natural Gas Co. and a life long resident of eastern Washington County, Ohio, died at his home at Bloomfield, Ohio, January 14, following a heart attack. He was employed by the Hope company for 36 years, retiring 5 years ago. He is survived by his widow, seven daughters and six sons.

CHARLES DYAR, 54, drilling contractor of Sweetwater, Tex., died at his home in Sweetwater January 17. Mr. Dyar went to Texas in 1921 and became associated with his brother, Albert, in the oil-drilling contracting business. The pair pioneered in the Ranger oil field under the name of Dyar Brothers Drilling Co. Besides the widow, he is survived by a son and three daughters.

JOHN FERLIN, 85, a pioneer oil driller, died suddenly last week at his home in Tulsa. His death resulted from bronchial pneumonia. Surviving are his widow, two sons and three daughters.

ALBERT L. BROWN, 69, vice president, Bigheart Producing & Refining Co., prior to its absorption by Barnsdall Oil Co., died at a New York City hotel on January 7.

GRANT WEST, 69, retired employe of United Natural Gas Co., died at his home in Brookville, Pa., recently, of a heart attack. He was retired in 1937. His widow survives.

WILLIAM WESLEY STANFIELD, JR., 31, died at his home in Houston, Tex., last week, following a long illness. He had been associated with Gulf Oil Corp. since 1930. His widow and a daughter survive.

JOHN M. PYTCHER, 68, who until his retirement 3 years ago was an employe of United Natural Gas Co., died at his home in Ormsby, Pa., last week, following an illness. He is survived by his wife, seven daughters and three sons.

BAIRD H. MARKHAM, JR., 25, first lieutenant in the Forty-fifth Division, U. S. Army, was killed in an automobile accident near Camp Barkeley, Abilene, Tex., last Saturday night. Lieutenant Markham, son of Gen. Baird H. Markham, Sr., former commander of the Forty-fifth Division, and director of the American Petroleum Industries Committee of the American Petroleum Institute, was adjutant of the headquarters detachment.

HUBERT H. PRATT, 46, operator at the Mid-Continent Petroleum Corp. refinery at Tulsa, died at his home in Tulsa Sunday, after a brief illness. His widow, two sons and four daughters survive.

HARRY W. DOREMUS, 76, assistant secretary of several departments of Standard Oil Co. from 1886 to 1903 and later an advertising executive, died January 14 at a New York City hospital.

HARRY B. GARDEN, independent oil producer, died last week at his home in Hutchinson, Kans.

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THE MARKETS*

CRUDE OIL: Prices firm in all fields east of the Rocky Mountains, particularly in Middle West where new drilling, now under restraint of Conservation Order M-68, is unable to offset normal declines in producing fields. Buyers soliciting connections in most Mid-Continent areas.

REFINERY PRODUCTS: All prices unchanged at ceiling levels which were reaffirmed this week by Leon Henderson, administrator of the OPA, who set quotations existing on November 7. Gasoline slightly softer on Gulf Coast. Other markets firm.

TANK WAGON AND POSTED DEALER: Scattered advances authorized in depressed localities of Wisconsin. Fuel distributors eliminate soft spots.

FINANCIAL: Pressure was relieved from oil securities to a modest extent. Average of 30 representative stocks for week ended January 17: High, 24.00; low, 22.61; close, 23.49. Week ended January 10: High, 23.92; low, 22.55; close, 22.81.

*Additional information in the market section.

Natural Gasoline

California Production Shows Slight Decline

LOS ANGELES, Calif.—Production of natural gasoline in California in November declined to 38,115 bbl. daily against 38,480 bbl. in October. There were 87 plants in operation during November, one less than reported in October.

Manufacturers delivered to refiners, jobbers and used in plant blending operations an average of 39,517 bbl. daily in November compared to 39,795 bbl. for October.

Liquefied petroleum gas production totaled 181,381 bbl. Details of November operations are shown below:

CALIFORNIA NATURAL-GASOLINE PLANT OPERATIONS

	Gas treated (M.c.f.)	Natural gasoline produced (gal.)	Plants operating da. cap. (M.c.f.)
San Joaquin Valley—			
Belridge	2,693,875	1,688,664	210,000
Kettleman Hills	9,618,644	9,608,271	535,000
Midway-Sunset	781,065	1,649,435	40,500
Mountain view	119,486	221,126	30,000
Miscellaneous	3,121,945	2,551,763	138,300
Coastal district—			
Elwood	342,454	433,513	29,500
Santa Maria	247,492	556,591	9,500
Ventura Avenue	3,355,550	5,271,177	155,000
Miscellaneous	934,964	900,162	74,500
Los Angeles basin—			
Brea-Olinda-Coyote	382,947	1,450,306	40,000
Dominguez	1,650,009	2,123,606	69,000
Huntington Beach	763,798	2,523,358	90,000
Long Beach	1,978,202	7,123,425	137,500
Montebello	911,946	1,740,458	105,000
Richfield	175,405	622,111	35,000
Rosecrans	994,143	1,258,827	54,000
Santa Fe Springs	1,184,855	4,444,060	175,000
Torrance	156,494	571,193	14,500
Miscellaneous	2,120,231	3,287,291	136,000
Total (all fields)	31,533,505	48,925,337	2,078,300

Distribution

	Gallons	Gallons
Stocks beginning of month	1,766,338	
Production during month	48,025,337	
Delivered to refineries		47,947,172
Blended at plants for production of motor fuel		13,081
Losses		63,038
Stocks end of month		1,768,384
Total	49,791,675	49,791,675

Hanlon Gasoline Co. Adds Two Sweetening Units

Hanlon Gasoline Co. announced the completion of Perco copper-sweetening units at its McLean and Breckenridge, Tex., gasoline plants. Each has 40,000 gal. per day nominal treating capacity.

Natural-Gasoline Yield Continues Increase

WASHINGTON, D. C. — Another increase of 8,000 bbl. in the daily average production of natural gasoline was reported in November by the Bureau of Mines. Yield for the nation was placed at 200,000 bbl. daily in November compared with 192,000 bbl. in October. Production during the first 11 months of 1941 averaged 174,000 bbl. daily against 166,000 bbl. for the same period a year earlier. The production figures include recycle condensate.

Chief increases in November occurred in Louisiana, the Appalachian and the Texas Gulf Coast districts.

Stocks of natural gasoline continued to decrease, amounting to 191,394,000 gal. on November 30, compared with 204,540,000 gal. on October 31 and 256,264,000 gal., on November 30, 1940.

Both shipments to jobbers and retailers and to refinery-owned bulk plants increased in November and were 32,340,000 and 8,358,000 gal., compared with 28,980,000 and 5,292,000, respectively, in October. Average vapor pressure increased for all shipments; the weighted average for the month was 20.4 lb. compared with 19.1 lb. for October and 20.3 in November 1940.

The production in November by districts is shown below (in thousands of gallons):

PRODUCTION

	Nov., 1941	Jan.-Nov., 1941	Jan.-Nov., 1940
Appalachian	9,320	82,028	73,370
Ill., Mich., Ky.	7,350	61,077	30,073
Oklahoma	33,097	348,620	367,443
Oklahoma City	6,311	64,717	75,491
Osage County	5,154	52,558	48,779
Seminole	9,008	101,714	108,851
Rest of state	12,624	129,631	134,322
Kansas	6,804	65,538	58,350
Texas	110,129	1,070,152	844,898
Gulf	31,817	269,332	176,810
East Texas	14,606	162,279	153,170
Panhandle	25,886	265,241	234,771
North Texas	2,335	24,776	41,377
West Central	4,886	54,278	56,880
Rest of state	30,599	294,246	181,890
Louisiana	25,090	158,197	103,352
Arkansas	3,149	32,308	29,282
Rocky Mountain	8,784	92,119	84,990
California	48,025	531,085	538,146
Huntington Beach	2,523	29,033	29,042
Kettleman Hills	9,608	105,704	116,773
Long Beach	7,124	81,067	82,156
Santa Fe Springs	4,444	51,013	52,086
Ventura Avenue	5,271	52,839	58,708
Rest of state	19,055	211,429	199,383
Total	251,748	2,441,124	2,129,904
Daily average	8,392	7,309	6,358
Total (thous. bbl.)	5,994	58,122	50,712
Daily average	200	174	166

James E. Pew Joins OPC's Natural-Gasoline Staff

WASHINGTON, D. C.—James E. Pew, Charleston, W. Va., last week was appointed assistant to Paul M. Raigorodsky, chief of the natural gas and natural gasoline section of the Office of Petroleum Coordinator.

Mr. Pew is a native of Pennsylvania and has been engaged in the natural-gas industry for 18 years. Before joining the OPC staff, Mr. Pew was superintendent in charge of production, construction, design and maintenance of natural-gasoline plants for the Virginian Gasoline and Oil Co. of Charleston.

Natural Gas

Sulfur-Removal Plant in Macedonia Field Considered

MAGNOLIA, Ark.—Preliminary plans for construction of another plant for removal of sulfur from South Arkansas gas production were to have been discussed January 22 at Lewisville, Ark., where the state Oil and Gas Commission met to hear testimony on the new Midway field.

The newest gas purification project under consideration is for Arkansas-Louisiana Gas Co. which has taken option on a tract about 1 mile northwest of the Macedonia field. The company may treat gas produced from the Dorcheat and Macedonia field to the ultimate extent of 90,000,000 cu. ft. daily.

McKamie Gas Cleaning Co., a subsidiary of Standard Oil Co. (New Jersey), previously announced decision to build a desulfurization plant in the McKamie field which will purify approximately 30,000,000 cu. ft. of sour gas daily. In conjunction with the purification process, the McKamie company is to build extraction facilities that will recover 20,000 gal. of natural gasoline daily.

Repressuring of Pettit Zone In Lisbon Field Discussed

SHREVEPORT, La.—General repressuring for the Pettit lime zone in the Lisbon field was considered here last week by about 40 field operators at a preliminary discussion of the issues.

Refinery News

J. Oostermeyer Elected Head of Shell Chemical

SAN FRANCISCO, Calif. Jan. 19—Election of J. Oostermeyer as president of Shell Chemical Co., was announced at the company's offices here this week. He succeeds C. B. de Bruijn who retired after 33 years of service with Shell.

J. OOSTERMEYER

Mr. Oostermeyer has been connected with Shell for 25 years and since 1939 has been vice president of the chemical company. For the last 2 years he has been actively concerned with the expansion of Shell Chemical's plant facilities for the manufacture of chemical products from petroleum. The company is now operating three plants on the Pacific Coast at Dominguez, near Los Angeles, at Pittsburgh and at Martinez on San Francisco Bay.

C.I.O. Wins Labor Board Election at Port Arthur

PORT ARTHUR, Tex., Jan. 19.—At a National Labor Relations Board election at the Texas Co. refinery in Port Arthur, Tex., last week, the Oil Workers' International Union (C.I.O.) was chosen as the official bargaining agent for 2,799 general employes. Of the votes cast, 1,351 favored the C.I.O. union, 67 were for the A. F. of L. operating engineers union while 781 were for neither union to represent them.

Toluene Plant to Be Added At Pan American Refinery

TEXAS CITY, Tex.—Pan American Refining Co., operator of a 97,000-bbl. refinery here, has entered into a contract with the federal Government to manufacture toluene. Addition of a unit for recovery of the component hydrocarbons will be started as soon as designs are completed and arrangements made for the necessary equipment.

Osceola Refining Co. Starts Runs at Michigan Plant

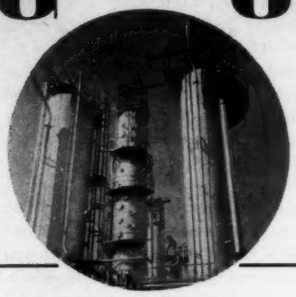
REED CITY, Mich.—Osceola Refining Co. placed its new 2,000-bbl. skimming plant here on stream last week. The plant is operating on Reed City crude delivered via Simrall Corp. pipe-line facilities.

Allis-Chalmers Model E Winch Tractor with Mast

Operators and contractors in oil fields all over the world recognize Allis-Chalmers Winch Tractors as the fastest well pulling equipment, because: they have a 30 m.p.h. road speed, have 8 line speeds on the pulling drum. They will get to a job in a hurry regardless of weather or ground conditions, and get it done just as fast. They are equipped with large 28″ x 12.75″ low pressure pneumatic tractor tires (carrying 10 to 20 lbs. air pressure)—for exceptionally bad swampy territory, dual wheels and tires on the rear make it a swamp buggy.

Model E Winch Tractor—for cleaning out and servicing deep wells. Maximum line pull 58,970 lbs. Capacity 9,740′ of ½″ line. Winch drum has eight line speeds to 1,074 ft. p. m. at 1200 engine r.p.m. Pulling drums are equipped with Cooper, patented, circulating air-cooled brakes. This unit is available with double drums, (capacity front drum 9,740′ of ½″ line, capacity rear drum 7,330′ of ½″ line), telescoping mast, and rotary drive, or spudding equipment. This unit is also available, as the Model E skid winch, for truck mounting.

ENGINEERING AND OPERATING SECTION



JANUARY 22, 1942

Bender Lead Sulfide Treating Process Proves Economical

By LeROY EABY
Sinclair Refining Co., Marcus Hook, Pa.

The more efficient control over adding sulfur to refinery distillates when undergoing the lead sulfide doctor treatment has lessened the extent to which oxygen is needed to contact the chemicals and oil and a substantial savings in the quantity of chemicals needed for sweetening has resulted. The new process was developed and is in use in a large East Coast refinery.

A TREATING system has been developed at the Sinclair plant in Marcus Hook, Pa., which has proved particularly economical for treating this refinery's heavier products, and has shown advantages in the sweetening of light products that should earn for the system a place comparable with other commercial treating methods. Previous to the adoption of its new system this refinery had what was considered an efficient treating plant employing acid and doctor for treating its heavier products, and a doctor system including a blackstrap revivifier for sweetening its gasoline. This old system was abandoned and for the past 2 years all the refinery's straightrun, cracked, and polymer products have been treated by its new system with a decided economic and material saving over the doctor and acid treats in previous use. Many hundred thousands of barrels of these refinery products have been treated during this period. Hundreds of barrels of kerosene have been treated daily at an extremely low cost. Nearly as easily has been treated a sour heating oil stock over the same period. Cracked gasolines having mercaptan contents as high as 0.047 per cent have been satisfactorily treated at rates up to 450 bbl. per hour. Even polymer gasoline with vapor pressures up to 40 lb. R.v.p. is sweetened continuously with practically no loss of stock. These treating systems were easily constructed with a minimum initial cost. Their operation is simple and requires little attention when functioning properly.

The presence of certain organic sulfides in petroleum distillates are objectionable and are removed or converted to less objectionable forms by most refiners. The principal group of sulfur compounds and those most objectionable in raw petroleum distillates are the mercaptans. The well-known doctor treat converts the mercaptan sulfur to the less objectionable disulfide form according to the established equation:

$$2RSH + Na_2PbO_2 \rightarrow Pb(SR)_2 + NaOH$$

$$Pb(SR)_2 + S \rightarrow RSSR + PbS$$

In theory this process is straightforward, but in its practical use refiners have long observed that there is a much greater conversion of mercaptan to disulfide per unit weight of sodium plumbite than could be expected according to calculations based on the fundamental reaction. This phenomenon was further borne out by investigations of Wendt and Diggs,[1] Greer,[2] and Lachman[3] and others.

Secondary Reactions

The investigations into the mechanism of the secondary reactions have been helpful but not conclusive and revolved about the lead sulfide produced by the primary reaction; that is, the doctor and sulfur reactions. Several investigators, including Lachman, Happel and Robertson,[4] suggested, and later work by Bender,[5] indicated that lead sulfide had a definite catalytic effect for assisting certain reactions aside from the common doctor reaction. Several of these side reactions were reported by these investigators and it is probable that all of these and perhaps others take place at the same time and each to an extent depending upon the concentrations of sulfur, oxygen, and sodium hydroxide used in the sweetening process. That these reactions take place and can be controlled is borne out by reports on experimental treating systems using lead sulfide as a catalytic material or as a partial catalyst. Rowsey[6] reports a sweetening system using a slurry of lead sulfide, sodium hydroxide solution and oxygen. The Standard Oil Development Co.[7] reported a process using lead sulfide, sodium hydroxide and sulfur with the addition of oxygen being optional. The process submitted by Happel and Robertson[8] uses all four of these materials mentioned above. However, the latter stipulates that the use of oxygen is necessary in a sweetening system using lead sulfide.

Function of Sulfur Stressed

The recent work of Bender along lines not emphasized by previous investigators has led to the development of a sweetening unit which has proved practical and economical. Instead of stressing the use of oxygen in a lead sulfide system it was found that the function of sulfur could be stressed instead. By developing a system where sulfur was the principal reactant and where oxygen was used only sparingly to prolong the effective sweetening period of the lead sulfide catalytic charge, several of the practical difficulties involving the use of air or oxygen were eliminated. It is mechanically much less difficult to effectively supply sulfur to a treating system than it is to efficiently inject air or oxygen.

The principal reaction then tentatively submitted for the Bender system would be:

$$2RSH + S \xrightarrow{PbS} R_2S_2 + H_2S$$

This reaction has been experimentally justified. To propel the action forward just enough sodium hydroxide solution was introduced to remove the hydrogen sulfide.

$$H_2S + NaOH \rightarrow NaHS + H_2O$$

Where certain refinery conditions allow it, the use of ammonia may advantageously be substituted for sodium hydroxide solution. By carefully controlling the supply of alkali to the reaction bed the above reactions perform well. When oxygen is added a new set of reactions is motivated and the use of oxygen indiscriminately not only disrupts the principal sulfur reaction but causes harmful effects on the lead sulfide catalytic ma-

*United States patents pending.

terial. On a commercial system it has been found that too great a reliance upon oxygen for sweetening according to the reaction

$$2RSH + O_2 \xrightarrow{PbS} RSSR + H_2O$$

is economically unjustified by the destructive action on the lead sulfide catalyst according to the reaction

$$PbS + 2[O]_2 \rightarrow PbSO_4$$

which accompanies the sweetening reaction. It is difficult and impractical to convert lead sulfate back to the sulfide. Lead sulfate possesses little or no sweetening characteristics.

Difficulties of Commercial Application

The application of the laboratory theory to the design of a working unit of commercial size created physical difficulties which if not overcome would render only another good laboratory process impractical. The small amount of published material on the practical application of any catalytic system for sweetening with lead sulfide would seem to indicate this to be the principal obstacle to its wider use in refineries. Some of the chief problems which impeded the development of a commercial unit are listed briefly:

1. Simple and efficient feed and control of sulfur.
2. Efficient control, injection, and dispersion of the alkali solution through the catalyst bed.
3. Determination of the best form and the best method of producing lead sulfide for the catalyst.
4. Development of the most practical method of catalyst manufacture.
5. The adoption of a catalyst charge producing best results on the particular stock to be treated.

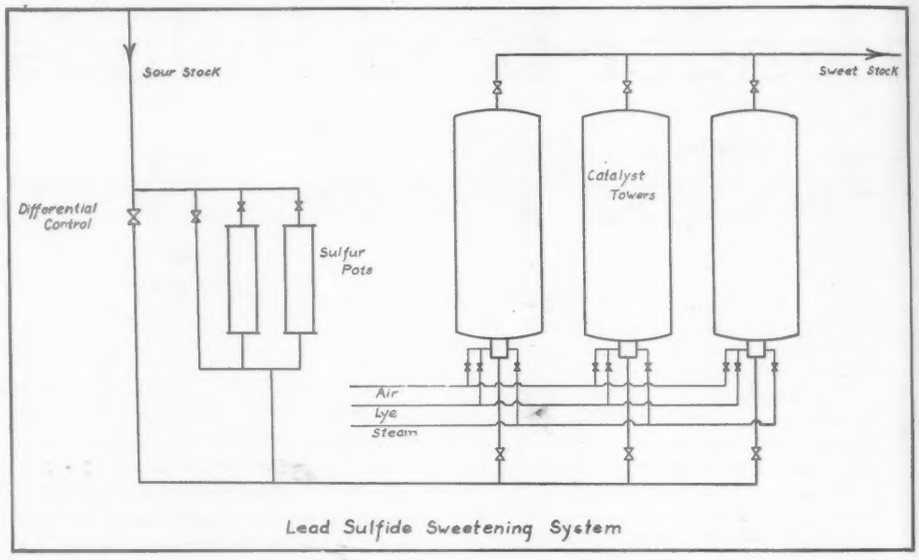
The choice of precipitated lead sulfide on a suitable carrier was made after many other means of constructing a catalyst bed were found unsatisfactory. Direct precipitation of lead sulfide on a carrier such as charcoal or other porous materials gave excellent treating results until the porous carrier became fouled, apparently due to the physical absorption characteristics of porous materials. This phenomenon may account for the so-called gums mentioned by other experimenters in this field, which had to be absorbed by suitable solvents to periodically rejuvenate the treating bed. The sacrifice of some contact surface was found worth resorting to a shell coating type of carrier. The manufacture of coated pellets required a consideration of various carrier materials as well as a binding solution which would possess the required properties for making a hard pellet and at the same time easily be adapted to a manufacturing process. Many of the common binding solutions in commercial use produced fine pellets but certain characteristics of each of these binders would render the lead sulfide shell inactive for the sweetening process or be readily destroyed by the oil or the entrained caustic in the oil being treated. A lead compound was chosen for the pellet shell which could be effectively converted to the sulfide after the catalyst material had been constructed and in place ready for use. A system was developed for the ready manufacture of catalyst pellets of high quality and effectiveness with mechanical equipment available at most refineries. The most efficient catalyst bed required a consideration of pellet size and catalyst bed proportions. The pellet size had to be judged according to the gravity of the stock to be treated and the velocity of the stock through the bed. The ratio of catalyst bed depth to diameter was designed according to the conventional laws for packed towers. The size of bed depended upon the type of stock treated. A series of smaller units was found advisable in general over fewer large units.

From the flow diagram it is obvious that with a few variations, according to the type of stock treated, the general flow system is simple and easily adapted to the treating of any refined stock. The catalyst towers are arranged in line to simplify piping. The base of each tower is constructed to facilitate the efficient injection of caustic solution, air, and steam. The air or steam is arranged to assist in dispersing the caustic solution into the oil entering the towers. In the majority of cases better performance was obtained using an upflow through the treating units. The sulfur is supplied from separate sulfur pots connected to a line parallel to the main feed line. The flow of oil through the sulfur pots is controlled by a pressure-differential valve in the main feed line. A secondary bypass line across the sulfur pots assists in sulfur control and in keeping sulfur lines free from sulfur deposits.

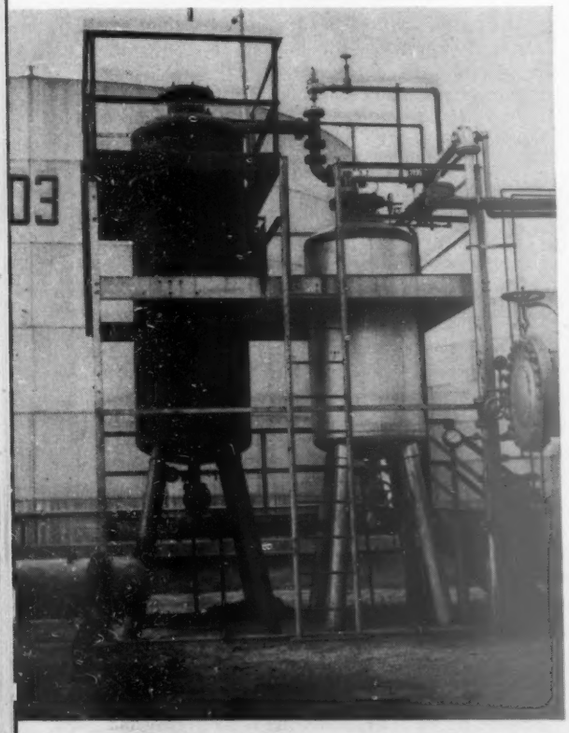
Requires Little Attention

The operation of a treating unit does not require much attention after the sulfur and lye are adjusted according to the mercaptan content of the stock being treated. Both of these materials are mainained at minimum requirements as an excess of sulfur would be detrimental to the octane value and the lead susceptibility of gasoline stocks and may increase the corrosiveness of any treated stock beyond acceptable limits. The excessive use of caustic solution decreases the physical life of the catalyst bed. To obtain the maximum length of service from a catalyst bed care must be used to remove as much of the injected lye as possible. This is best accomplished by a continuous injection of a small quantity of live steam. No air should be used until necessary to prolong the sweetening period of the catalyst charge after the normal action of the bed decreases due to physical disruptions within the catalyst bed affecting contact. Air is used sparingly at any time because its action tends to destroy the catalyst along with its sweetening action as already noted. It is possible, while treating certain stocks, to rapidly convert a complete catalyst charge to sulfate which soon renders it a total loss as a sweetening unit as well as the initial investment in lead.

The figures shown in the accompanying table were taken from actual treating records. They are



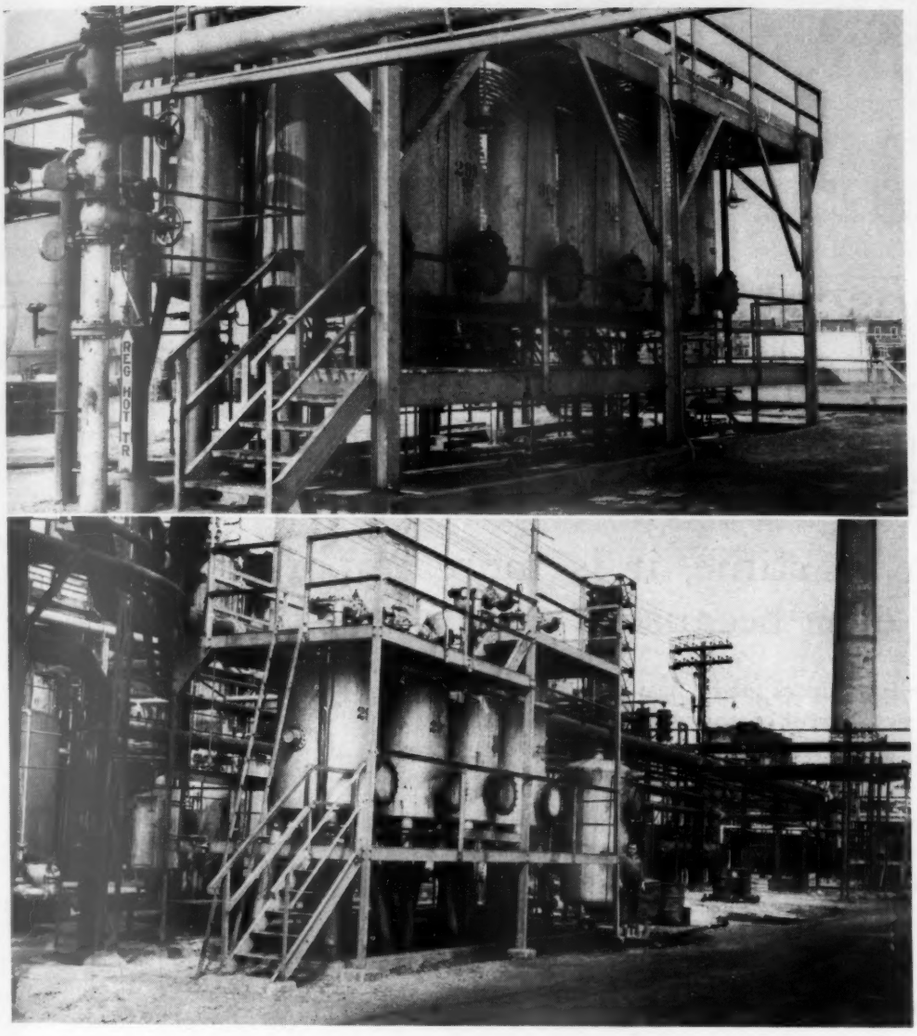
Lead Sulfide Sweetening System



Pair of towers for treating casing-head gasoline. A pair of towers similar to these has treated thousands of barrels of kerosene

REPRESENTATIVE TREATS WITH INDIVIDUAL TOWERS AS UNITS IN VARIOUS SYSTEMS EMPLOYING THE BENDER PROCESS

Stock treated—	Domestic heating oil	Kerosene	Straight-run gasoline	Heavy cracked gasoline	Polymerized gasoline	Casing head gasoline
Catalyst charge, cu. ft.	76	120	58	80	72	66
Hours on stream	2,352	3,761	2,248	1,728	1,536	2,304
Barrels treated	164,674	470,428	179,840	82,120	46,080	73,728
Maximum rate, barrels per hour	80	140	125	65	40	45
Average rate, barrels per hour	60	105	95	50	30	35
Average RSH, per cent	0.0150	0.0020	0.0017	0.0350	0.0500	0.0015



Top: Rear view of cracked-gasoline unit. Bottom: Units for treating a No. 2 fuel stock from a sour crude

representative treats and not necessarily the best to be expected. Each set of figures is given for a particular stock as treated through a single tower within a treating unit. During the period of time shown for each run the flow may have fluctuated between zero and the maximum rates shown as would occur in the usual plant operation. In some cases the type of stock treated also varied due to a variation in the crude stocks being run at the time. The treating runs were considered at an end when the physical condition of the catalyst bed deteriorated to a point where it had to be taken out of service. It should be noted, however, that this does not represent the end of the useful life of a catalyst bed. A catalyst charge, after being in place for a period of time, may lose its treating power due to the accumulation of moisture and subsequent channeling. This fault is easily cared for by simply steaming the bed in place, then removing it, drying and replacing it in the treating tower. With the exception of a small loss of lead sulfide during the handling and drying procedure the catalyst charge functions as a fresh charge. The volume of catalyst shown in the table represents the actual volume of catalyst charge in the treating tower and is not an indication of the amount of lead sulfide in the tower. The lead sulfide content of the charge would vary according to the size of pellets and the composition of the pellet coating which in turn depended upon the type of stock being treated.

Theoretically the Bender treating unit will operate for an indefinite length of time. It is of course unreasonable to expect such ideal performance with a commercial unit. However, the present degree of efficiency to which this process has been developed renders the system justifiable as an advantageous treating system. Further improvements will no doubt bring the system somewhat nearer to theoretical efficiency and thus improve its practical applications. Some of the present advantages of this system may be mentioned as follows:

Advantages of Method

1. The system functions efficiently on any refinery product which requires mercaptan conversion.
2. There is a decrease in chemical and operating costs per unit quantity of stock treated as compared with conventional treating systems.
3. There is a minimum of stock loss during treating.
4. All the chemicals used in the lead sulfide treat are weak or relatively harmless compared to the conventional doctor solution or acids of many systems.
5. The treating units are compact and require a small amount of refinery ground space.
6. The treating units may be conveniently placed near to the source of the stock to be treated or be included as an integral part of the still equipment producing the raw stock.
7. The treating units are flexible and the component towers of the system may be regulated or taken on or off the stream with a minimum of time or effort.
8. There is no extensive amount of equipment involved, no elaborate or complicated equipment, and where the stock to be treated is released from a pressure system pumps are not required.
9. Only a minimum of line and tankage is required.
10. The units are easily operated and when functioning properly require little attention.

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East Texas A.I.M.E. Honors W. S. Morris

THE meeting last week of the East Texas section of the A.I.M.E. at Kilgore, Tex., heard an address by C. P. Parsons, Halliburton Oilwell Cementing Co., on "The Use of Subsurface Calipers." The program included a dinner in honor of the speaker.

A part of the program was devoted to the presentation of a desk pen set to W. S. (Buck) Morris, field chairman of the East Texas Engineering Association, for his work in the A.I.M.E. organization. The presentation was made on behalf of the organization by N. N. Jones, senior engineer, Humble Oil & Refining Co., Tyler, Tex.

The accompanying picture shows from left to right: W. S. Morris; R. J. Dobson, district engineer, Shell Petroleum Corp., Kilgore; M. L. Mayfield, chief petroleum engineer, Cotton Valley Operators' Committee, Cotton Valley, La., and Lloyd Holsapple, engineer, Sinclair Prairie Oil Co., Troup, Tex.

Dubbscracking for war

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And the friendly and effective help of Universal's refining specialists goes with them

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THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

Drilling Records Permit Increase In Drilling Rig Efficiency

By HARRY F. SIMONS

Drilling contractors and rig owners are faced at the present time with maintaining rig efficiency in the face of a tightening of supplies. More zeal on the part of the crew will be an important factor but the greatest improvement can come through the compilation and use of a properly constructed well record.

THERE has been a marked advance in the type and completeness of records kept on the drilling operation in the past 25 years. Many drillers still in service can recall the days when there was no written record made on the well; others remember sitting in the shade of the dog house and fabricating a log after the well had been finished. A fairly complete record of the drilling operations is available to the producing department on present-day wells.

This record for the most part is designed for the producing department rather than for the use of the drilling rig owner or the crew. It does form a basis for a record which will show the various factors which are included in the cost of the drilling operation. The drilling report includes the footage made per tour, formations penetrated and their depths, deviation of the hole, downtime for rig repair, time consumed in making trips, running straight-hole tests, circulating for samples and coring. It also includes a record of the casing run in the hole.

In addition to the company record, the crew also has a drilling report to the contractor which shows essentially the same information as the company report except it is more complete. Rotary speed, pump speed and pressure, amount of weight run on the bit, time of making trips and the type of bit run in the hole, unusual conditions encountered while drilling, condition of the mud, materials used for treating mud, materials used for treating boiler feed water, repairs made on the rig and the replacement parts used and the number of joints and the makeup of the drill stem in the hole. If any unusual work is performed, this also is set down.

Keep Numerous Records on Rig

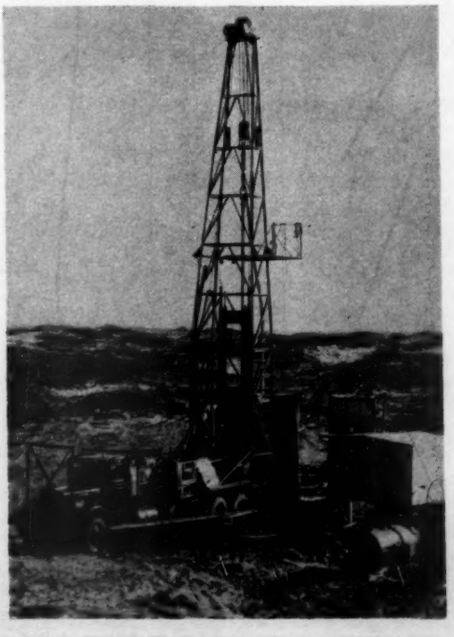
There are also the pipe tally and the bit record. The former may be kept in a regular pocket-size book similar to a time record, or it may be kept on a board furnished as an advertisement by the bit or supply companies. The pipe tally shows the length of each joint added, total number of joints in the string and the total depth. The bit record is a ledger-sheet affair which shows the make and type of bit run, the place it was run in the hole, time on bottom, footage made, rotary speed, weight on bit, pump speed and pressure, and the condition of the bit when pulled. Mud weight and viscosity are sometimes included.

Some companies also require a drilling-time record for certain intervals in the hole. These are desired because they give an indication of possible producing zones and offer a check on the electric log. Where mud maintenance is a problem, a special record is provided as the complexity of the treatment prevents it from being kept on the drilling report. History of the drill pipe and tool joints is generally kept by the tool pusher or in the main office.

From the foregoing it can be seen that there is no dearth of records kept, or designed to be kept on the drilling rig. In many cases these reports are filled out faithfully, while in others they are kept only sketchily. In some few cases the data from these several records are compiled on one chart which permits some analysis of the drilling of the well. These charts generally show drilled depth against days with space allotted for notations on time lost. Summary of bits, cores and a diagram of the completion are included.

Such a report is very valuable as it gives the complete history of the drilling of the well on a single sheet and it is easily filed for reference. However, it is ordinarily made up in the office of the drilling contractor and kept there. It is not generally available to the men on the rig. It remains in the classification of a record rather than as a tool for increasing the efficiency of the rig and reducing drilling costs.

Primarily, a drilling record is a form of history and unfortunately many look lightly on that general subject and are not convinced of the value. One of the reasons advanced is the fact that in most cases each well drills differently. This may be true to some extent, but even in the most extreme cases there is enough similarity in wells in a particular field or area to make possible an improved program of rig operation if the information is compiled in the proper manner and made available to the drillers on the job. Such records also make it possible for the drilling contractors to more closely estimate costs.



Drilling an exploratory well on the Texas plains. Compilation of drilling data on such holes aids materially in reducing exploitation costs

Complicating Factors

Operation of a drilling rig is a complicated business and there is a large number of variable and intangible factors which enter into any analysis. There is a certain amount of competition between the crews in the making of hole. For the most part, however, drillers keep their attention on drilling the hole at the least cost to the contractor rather than on beating the other men working on the well. The exact weight to be placed on each of the factors affecting rig operation is very difficult to determine.

Mainly, increasing rig efficiency consists of two things. The first has to do with machinery maintenance and the second has to do primarily with bit selection and operation. The former includes keeping the rig in such repair that it can operate as many hours a day as possible; in many cases this depends on the skill of the crew plus their willingness to shut down and make small repairs in order that major repairs may be avoided. The design of the rig is also an important factor.

Bit selection and operation will always be a matter of judgment tempered by experience and the records available. It will also depend on the policy of the contractor and whether he is more conscious of bit costs than he is over-all rig costs. Some contractors order that the bits be worn out before being pulled from the hole, while others replace the bits more often and thereby reduce the time required to drill the hole. One company, in a particular field where it has drilled a large number of holes, has established almost an arbitrary schedule of bit changes.

The above holds for bit operation, some contractors ordering moderation in rotary speed and bit weight, others asking the drillers to run at a speed where drilling is the best without any upper or lower limits being imposed, and a third group ordering that the rig be run at full throttle at all times.

Regardless of the type of rig and how it is run, there is always the decision to be made by the driller as to whether the bit is dull and should be pulled. An experienced driller can almost always tell when the cutters or cones on a bit are locked and the bit is in a dangerous condition and should come out of the hole immediately. The action of the bit is a definite indication of this condition. The driller can also generally, but not always, tell when the bit is dull. The action of the bit in some formations will often lead a driller to pull a bit when he might just as well have left it on bottom. Generally, the driller's judgment on the bit's condition depends on his knowledge of the area and the time the bit has been in the hole as much as it does on the action of the bit.

However, the condition of the bit (unless it is

dangerous) is not the final answer to whether or not the bit should be pulled. Frequently, a bit can be saved and the rate of penetration can be increased by leaving a fairly dull bit on bottom for the drilling of an anticipated sand streak. Obviously, the driller must be acquainted with the geologic column or must have the logs of other wells available. The fact is, many sands will drill as easily with a dull bit as with a sharp one. If a bit has been in the hole any considerable length of time and then encounters a sand streak, the driller will generally pull it as soon as the underlying shale is encountered. This is because he knows that the bit is practically useless for drilling the less pervious shale which must be torn out by the sharp teeth of the bit.

Knowledge of such conditions will prompt the driller to leave the dull bit on bottom until the sand zone is encountered and drilled and the underlying shale or lime reached. The rate of penetration with the dull bit through the sand is almost as great as it would be with a sharp bit. A new bit run in on top of the shale will last much longer, cut a greater footage and give a much more satisfactory performance.

A tendency persists to run a bit designed for drilling hard formation as the well approaches the total depth without regard to the type of rock to be encountered. This results in excessive rig time and also runs up the total number of bits required to drill the well as the short-tooth bit rolls around on the bottom of the hole, makes little progress and is worn out quicker than one which will tear the formation apart. In some cases as many as two bits and 2 days' rig time have been saved by running a shale bit for drilling the hole immediately above the pay zone.

It can be seen that if the driller is furnished, or is made to compile a chart of each well drilled in the area, the selection of the type of bit, point of replacement and the general operation of the rig on future holes can be based more on fact and not so much on the memory of the personnel. Such a chart can be made with little trouble and includes for the most part complete information of the type which is now gathered erratically.

The question arises as to what information is wanted. The interval drilled by each bit means very little unless the conditions on the rig are given. The pump pressure, the strokes per minute, the weight on the bit, the rotary speed, viscosity and weight of the mud and the deviation of the hole are needed. These are all available and only need to be written down. The total number of revolutions required to drill the interval is useful although the ordinary rig does not include facilities for recording this factor; in lieu of it an accurate account of the actual time the bit was on bottom can be used.

Drilling Time

Unfortunately, most rigs are not equipped with drilling-time recorders, but a drilling-time log can be made by the driller or a member of the crew. If a satisfactory time log is made it will substitute for a geologic log of the well or will make the geology more easily understood to the driller. Either minutes per foot or feet per hour makes a satisfactory method of listing drilling time. Particularly, the drilling-time graph will show the cases in which the bit was changed without any increase (or a very small one) in drilling time being obtained; on the next well drilled in the area, the bit can be left in the hole longer at that point as there is no profit to be expected from changing it.

A chart showing the necessary information can be made mostly by the drilling crew while on tour as it deals with facts which are understood by them. Compilation of the material will make it easier for the men to interpret on the succeeding wells. The geologic log may be obtained after the well is drilled and made up in the home office. If it is drawn to the proper scale it can be pasted on the chart made at the rig.

In addition to the information relative to bit selection and operation contained on the chart, notations on mud treatment and other factors may be made. This will provide a guide and a reminder for the proper procedure on future wells.

The chart can be made on a regular form scaled off vertically in feet and horizontally in the proper units for each factor. It will provide a more complete and useful record than the present system.

The operations of most drilling contractors are fairly well localized and most of the field work and wildcat drilling is performed in an area where conditions are similar. In cases where the geologic conditions are reasonably uniform, reports on both field and wildcat tests drilled in the area will form an important part in reducing costs and anticipating trouble on any new hole drilled.

●

BOOK REVIEWS

THUNDER IN THE EARTH. Edwin Lanham. Harcourt, Brace & Co., New York. 570 pp. $2.75.

This novel takes for its scene "a violent, mushroom town that sprang up in the era of the greatest oil discovery in the world. Here is Texas in the 1930's going through the turbulent climax of the last of the reckless and unprincipled oil towns."

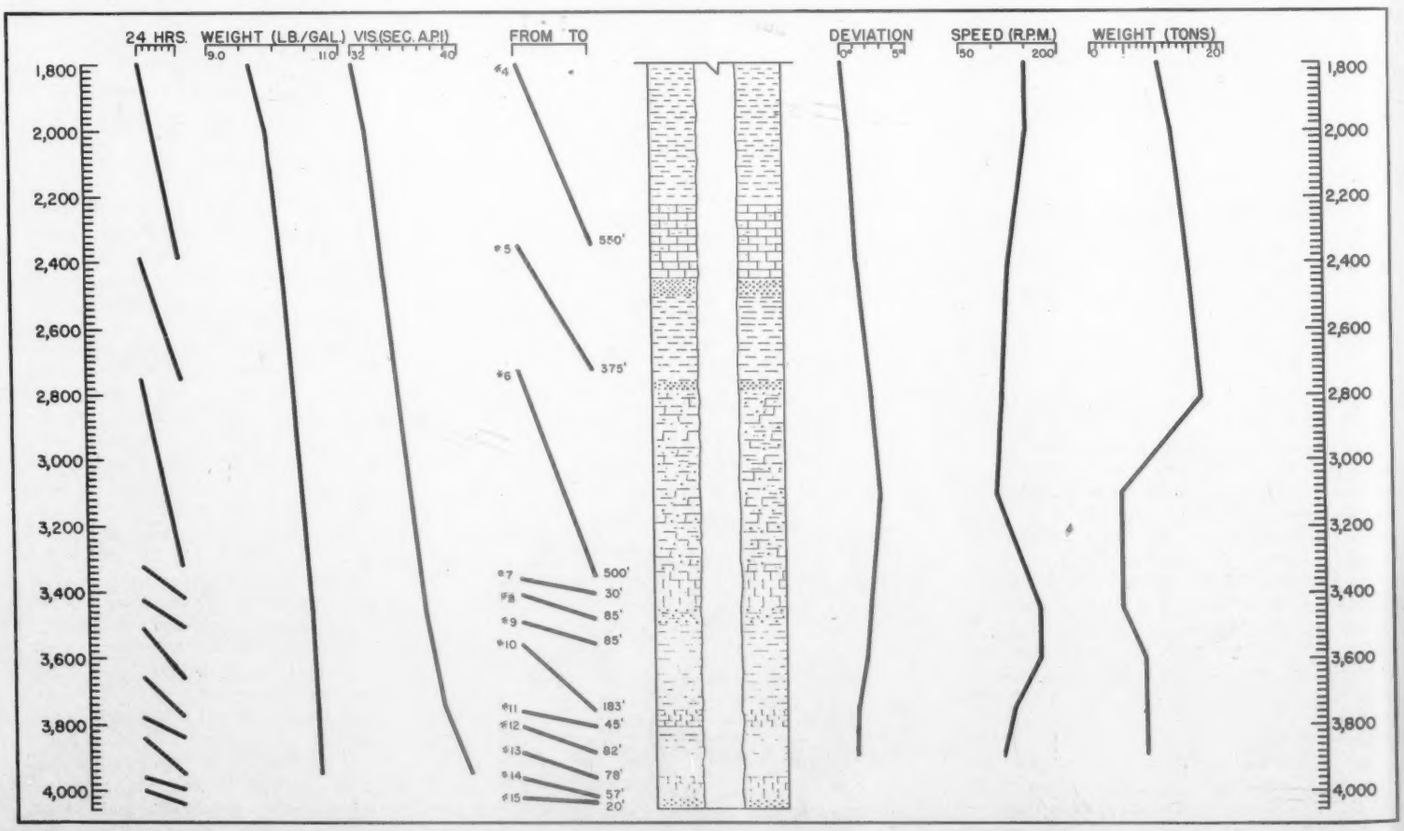


Chart showing one method of recording drilling data. It includes separate curves showing the footage drilled and the depth at the end of each day, mud weight and viscosity, footage made with each bit, formations drilled with each bit, log of the well, deviation of the hole from vertical, rotary speed and weight carried on the bit. A drilling-time record, or the actual time each bit was on bottom, was not available although it should be included to obtain the maximum benefit from the record

New Mississippi Refinery Processes Tinsley Crude In Combination Unit

By W. T. ZIEGENHAIN

IN the past 2 years Mississippi has well established itself as an oil state. In that period crude production has gradually risen to 76,000 bbl. daily. At present two refineries operate within its borders. Yet, Mississippi has never witnessed a real "oil boom." Maybe this is because these results have come from unusually hard work and they certainly involved more than the average run of disappointments. Yet, considering oil produced daily it now stands ahead of the veteran states of Pennsylvania, Michigan and Arkansas.

Of the three established oil-producing fields, Tinsley is the largest and now accounts for over 74,000 bbl. of the above total output. To date the great bulk of this oil has moved from the field by tank cars and this practice continues except for 3,500 bbl. which moves through a 4-in. pipe line to the Paluxy Asphalt Co.'s plant near Yazoo City, the newer of the two plants in the state. Recently this plant was expanded to include a viscosity breaker and its steam-generating capacity was doubled by installing a second 200-hp. boiler.

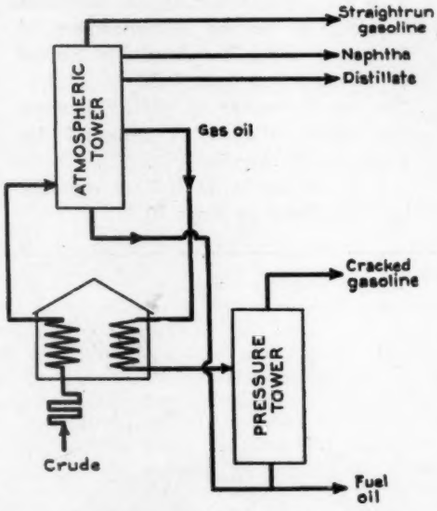
This plant includes a gas-oil cracking unit and is, therefore, better equipped to handle the Tinsley crude. The normal plant blend of straightrun and cracked Tinsley gasolines plus lead supplies motor fuels meeting market octane demands for all three grades. A typical motor gasoline made from this crude shows a base octane value of 52. With 3 cc. of lead added this gasoline shows a 76-plus value.

Mississippi Requirements

It is pertinent that the State of Mississippi provides for grading gasoline according to C.F.R. octane number, the three classes of fuel being specified as:

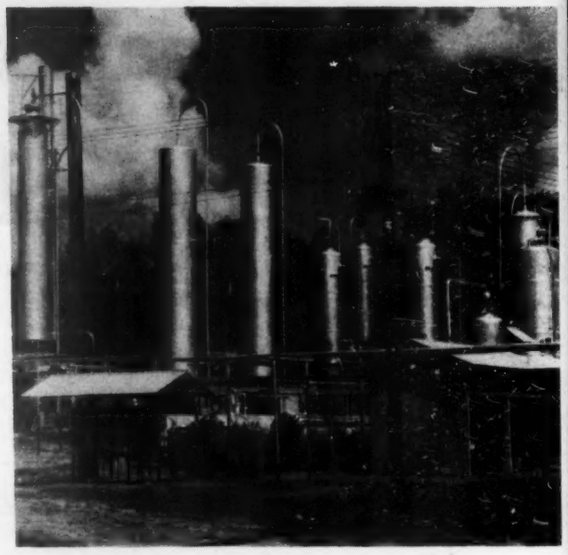
Premium grade—76 minimum octane number.
Regular grade—68 to 76 octane number.
Third grade—50 to 68 octane number.

Paluxy and other marketers in the state have generally supplied 70 to 72-octane material on the regular-grade commitments and the market has been generally established for this quality as the regular grade. As a result of this, Paluxy has designed its plant operations to recover a 360-end-point straightrun gasoline as the base product. The regular grade is essentially a blend of this and 65-octane cracked material leaded to 70 or 72, while the premium fuel is essentially the same but with more lead added.



Simplified flow chart of combination unit

Reference to the simplified flow chart reflects the manner in which the crude is topped to recover the straightrun gasoline while side streams are taken off, including naphtha, kerosene, distillate and gas oil. The distillate cut may be regulated to recover a household burning oil, diesel fuel or tractor fuel. The residuum from this operation is a 14-gravity material which is delivered hot to a vacuum stripper to recover additional gas oil and the resulting residuum from this operation is then blended with the cracked residuum coming from another evaporator tower to make a Bunker C grade of fuel oil.



General view of gasoline-treating equipment

The gas oil recovered from the crude fractionator plus the gas oil recovered from the vacuum stripper are continuously heated in a second coil within the combination furnace and the hot oil is then fractionated to recover the cracked gasoline.

Other facilities in the plant include a Hoover treater for sweetening the cracked gasoline, caustic scrubbers for the straightrun gasoline, a 14-car railroad loading rack, truck rack and two 200-hp. steam generators.

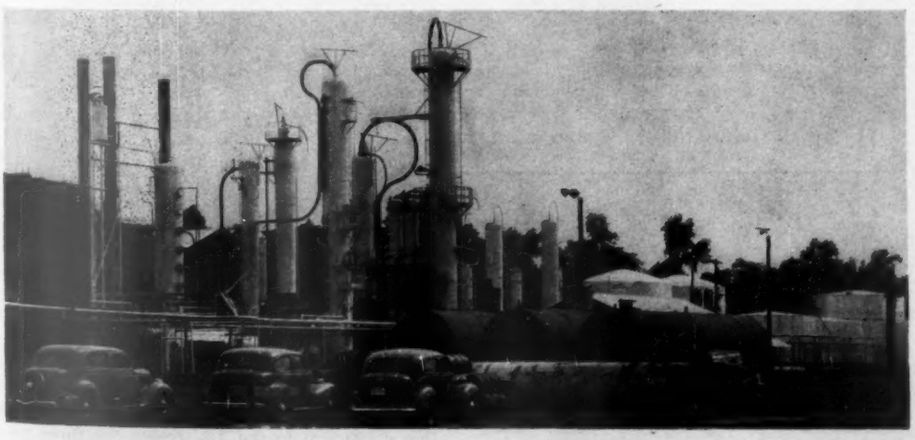
Market Territory

The market territory served by the new plant covers a relatively large area. Shipments by tank truck serve a large share of the demand around Yazoo City. Yet, while these represent a substantial quantity, they do not absorb anything like the plant's output.

As time passes, more attention will no doubt be given to establishing freight tariffs out of the two specific Mississippi refineries to markets throughout the Southeast in particular. Major attention will also be directed to rates from these points to the Chicago and Ohio markets where the Mississippi refiners come into direct competition with refiners already located within that area. The latter, of course, receive their crude oil by pipe line from Oklahoma, Kansas, Illinois and Texas.

In the Southeast, Mississippi refiners can also foresee complications arising from a tariff standpoint due to the extension of gasoline pipe lines into that area which start from Baton Rouge, La., or from Gulf Coast water terminals supplied by tanker and barge from large refineries located in coastal Texas and Louisiana.

Furthermore, the total motor-fuel consumption in the Southeast is small compared with that of the northern half of the Atlantic seaboard and despite any advantage Mississippi refiners might have in reaching the Southeast due to the lesser distance to market, competition is expected to remain unusually keen.



General view of the 3,500-bbl. refinery of the Paluxy Asphalt Co., at Yazoo City, Miss. The picture was taken during construction of new viscosity-breaker unit

Application of Spectroscopy in The Petroleum Industry

By J. RUD NIELSEN
University of Oklahoma Research Institute

Spectroscopic phenomena have been observed for many years and their value has been recognized, generally, by scientists. Industry has been rather slow in using spectroscopy and only in recent years have the practical applications been studied. In this article, the author points out the uses of this science in the petroleum industry.

This paper was originally presented at a joint symposium of the American Association for the Advancement of Science and the American Association of Physics Teachers held in Dallas, Tex., on December 30, 1941. Following the meeting the author prepared the paper for publication.

A biography of Dr. Neilsen appears in Journalisms on Page 80.

WHILE spectroscopy has been employed in metallurgical and other industries for some time, its application in the oil industry is just beginning. The majority of oil companies have no spectroscopic equipment as yet. However, a number of companies are experimenting with spectroscopic methods, and a few have put such methods into routine use. It is safe to predict that as the oil industry continues its transformation from a raw-materials-producing industry into a chemical industry it will become an important field for applications of spectroscopy.

The purpose of the present paper is to call attention to some of the opportunities which spectroscopy offers to the oil industry and to give a picture, necessarily incomplete, of present applications. Because of space limitations, it will be necessary to interpret the term spectroscopy in its narrowest sense. I shall not mention applications of colorimetry and fluorescence; nor, of course, of the mass spectrograph. I shall discuss in turn some applications, potential or actual, of emission spectra, ultraviolet and visible absorption spectra, infrared absorption spectra, and Raman spectra.

Emission spectra.—Molecular emission spectra are difficult to produce. Moreover, because of their complexity, they would rarely be of practical value. In the electric arc or spark the excitation is so violent that the molecules break up into atoms; hence, the spectrum emitted is mainly due to neutral or ionized atoms. The wave-lengths emitted reveal what chemical elements are present, and the intensities of the spectral lines indicate the concentration of each element. This is the basis of ordinary spectrographic analysis. With the available spectrographs, it is possible by this method to detect about 70 elements, and the sensitivity is extremely high. Among the elements which cannot be determined are carbon, hydrogen, oxygen, nitrogen, chlorine, and other nonmetals. Since petroleum consists mainly of carbon and hydrogen, ordinary spectrographic analysis is of limited value for studying the composition of petroleum. It has, nevertheless, found many important applications in the oil industry.

Analysis by Emission Spectra

Spectrographic analysis by emission spectra is used to determine various inorganic impurities in crude oil and to detect helium in natural gas. At least two oil companies use emission spectra in engine-wear studies, to determine iron and other metals in crankcase oil, and for testing the corrosion and wear characteristics of lubricating oils and greases. Amounts of iron as small as one part per million are readily detected, and a concentration of 10 p.p.m. can be measured with a precision of 5 per cent. In the oil industry many materials are tested besides oil. Spectrographic analysis is used to analyze steel castings, bearing metals, ash, sludges, sediments, clays, and so on. It is used for determining impurities in catalytic materials; and this is a very important application, since an extremely small amount of a foreign substance may greatly affect the efficiency of a catalyst.

Emission spectra are used by at least one or two companies for analysis of oil-field waters. Because of its ability to detect metallic elements present in extremely small concentrations, the spectrographic method gives far more complete information about the cations present in the water than does the ordinary chemical analysis. It is also much less time consuming. On the other hand, the spectrographic method gives little information about anions, and it involves considerable initial expense, both for equipment and for making the numerous working curves required for quantitative analysis.

Spectrographic analysis by emission spectra is also used for core and soil analysis. It is useful in correlating geological strata and is believed to have diagnostic value in prospecting for oil deposits.

Ultraviolet and visible absorption spectra.—The aromatic hydrocarbons, such as benzene and toluene, have characteristic electronic absorption bands in the near ultraviolet which can be conveniently observed with a quartz or grating spectrograph. The paraffin hydrocarbons and the saturated naphthenes, on the other hand, have no absorption bands in the spectral range of the quartz spectrograph, and the olefins and acetylenes have bands only at the short wave-length end. The conditions are, therefore, favorable for the detection and quantitative determination of the various aromatics in petroleum by their ultraviolet absorption spectra. This method has recently been developed by Weizmann, Henri and Bergmann.[1] They used the absorption bands listed in Table 1. Their data for Iraq petroleum and Palestine shale oil are given in Table 2. This method is used by at least one American oil company for routine determination of toluene. It is bound to find much wider application in the near future. For example, it should be useful for testing the effectiveness of different procedures for catalytic aromatization and for the routine control of such processes. Ultraviolet absorption spectra may be used also to determine nonaromatic compounds with conjugated double bonds, such as butadiene which is produced from petroleum and used as raw material in the synthetic rubber industry. Of course, the method has its limitations. Thus, while it is possible by means of the ultraviolet absorption spectrum to differentiate, say, between toluene and xylene, it would hardly be possible to distinguish between such dialkylated benzenes as, say, *p*-ethyltoluene and *p*-propyltoluene.

TABLE 1

Benzene	2433 and 2375 A
Toluene	2700
Xylene	2713 and 2739
Naphthalene	3100
Phenanthrene	2932
Anthracene	3570 and 3760

TABLE 2

Aromatics—	Iraq petroleum, %	Palestine shale oil, %
Benzene	0.02	0.16
Toluene	0.31	0.18
Xylene	0.52	3.20
Naphthalene	0.30	4.60
Phenanthrene	1.36	1.80
Anthracene	1.76	1.60

Ultraviolet or visible absorption spectrophotometry is used to determine the transparency of petroleum products for various wave lengths. Another simple application is the rough determination of crude oil in cores by extracting with toluene and observing the decrease in transparency for a fixed wave length in the violet or near ultraviolet. It depends upon the fact that crude oil always contains light-absorbing materials.

Compounds Have Individual Spectra

Infrared absorption spectra.—All but a few chemical compounds have characteristic absorption bands in the infrared, each band corresponding, classically, to a so-called normal vibration of the absorbing molecule. A molecule consisting of n atoms has, in general, $3n$-6 normal vibrations, the frequencies of which depend upon the atomic masses and upon the forces set up when the molecule is distorted. Rotation of the molecules produces a fine structure of the vibration bands which, under ordinary experimental conditions, is observed merely as a broadening proportional to the square root of the absolute temperature. Except for enanthiomorphic stereo-isomers, different molecules have different infrared absorption spectra. Thus, no two of the five isomers of hexane have identical infrared absorption spectra, and *cis-* and *trans-* forms of a compound have different spectra.

Homologous compounds usually have certain vibration frequencies in common. This may be seen from Fig. 1 which gives the molal absorption coefficient in the 3.5μ region for three normal paraffins (tetradecane, heptadecane and tetratriacontane) and cetene. It should be noted that,

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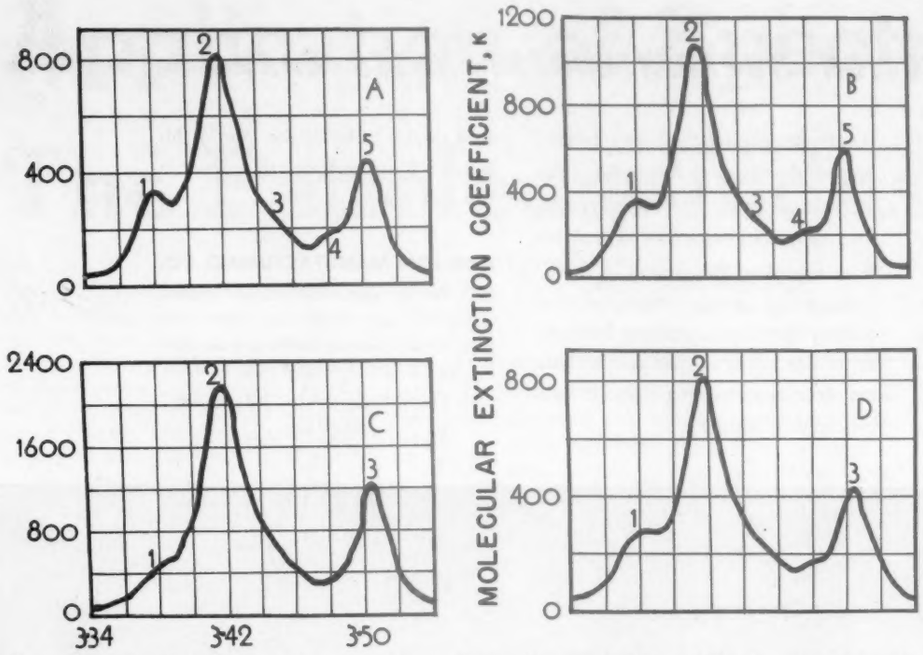


Fig. 1—Molecular absorption coefficient in narrow spectral region around 3.4μ. (a) Tetradecane; (b) Heptadecane; (c) Tetratriacontane; (d) Cetene. (From J. J. Fox and A. E. Martin, Proc. Roy. Soc. (A) 175, 208 1940).

while the absorption maxima in this region are at the same wave lengths for all these compounds, the amount of the absorption increases with increasing number of methylene groups in the chain. The single double bond in cetene cannot be detected in this spectral region, but it reveals itself by a band at 6.10μ. In fact, all olefins have an absorption band at 6.10μ, and all acetylenic hydrocarbons have a band at about 4.47μ. However, each compound has in addition its own characteristic frequencies. The infrared absorption spectrum is unquestionably the best "fingerprint" available at present for identifying chemical compounds.

When a mixture of nonpolar and nonreactive compounds is investigated, it is found that the spectrum of each compound is almost completely independent of the presence of the other compounds. The infrared spectra of the individual compounds are simply superposed. For this reason, the analysis of such mixtures by the infrared absorption spectra is fundamentally simpler than the analysis, say, of metallic alloys by emission spectra. Moreover, the infrared spectrum can be observed without producing any change whatsoever in the sample. In mixtures of nonpolar compounds there is a small amount of interference; and whenever chelation, polymerization or other chemical reactions occur, they are revealed by changes in the infrared absorption spectrum.

It follows from these facts that infrared spectroscopy has much to offer to chemistry, and not least to petroleum chemistry which deals mainly with compounds that are very difficult to identify. However, while infrared absorption spectra have been used for two or three decades as a source of information about molecular structure, their utilization for analysis has become practicable only after the development of recording infrared spectrographs. Lecomte and Lambert,[2] in France, began to apply such an instrument to the analysis of hydrocarbon mixtures more than 10 years ago. In this country, the practical application of infrared spectra began somewhat later. However, thanks largely to the efforts of Randall and his coworkers at the University of Michigan, better recording spectrographs have been developed here, and greater practical success has been attained. So far, however, little has been published. The only fairly comprehensive paper available on the application of infrared spectra to industrial research was published a year ago by Wright,[3] who has been remarkably successful in solving a variety of analytical problems.

In his laboratory two infrared recording spectrographs are being used 8 hours a day for qualitative and quantitative analysis. In addition, Wright and his coworkers have developed an instrument which continually analyzes and records the infrared absorption of a hydrocarbon gas flowing through a cell. This apparatus is set up in a plant and is used for control of distillation.

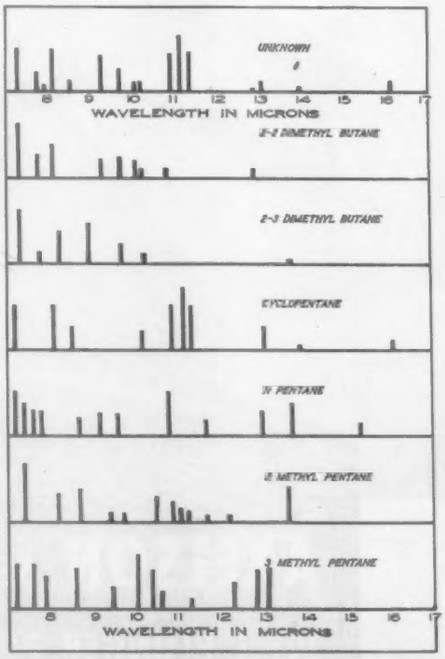


Fig. 2—Analysis of cyclopentane cut by infrared absorption spectrum. (From W. H. Avery, J. Opt. Soc. Amer. 31, 633, 1941)

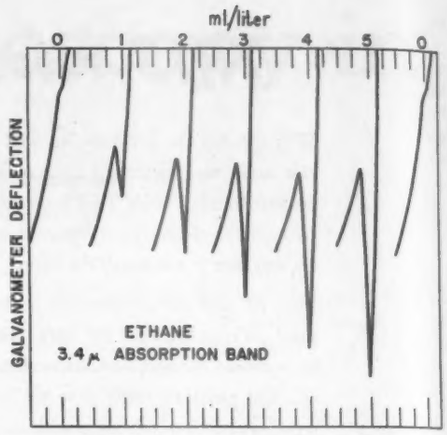


Fig. 3—3.4μ Absorption band for different concentrations of ethane in air

Next to the problem of identifying a pure compound, the simplest analytical problem is that of determining a single impurity, or the composition of a binary mixture. In cases such as those reported by Wright (say, 1,2-dibromopropane in 1,3-dibromopropane) it is possible to detect as little as 0.1 to 0.05 per cent (by volume) of the impurity, the precision being about 0.05 per cent of total sample.

Fig. 2 shows an example given by Avery[4] of the analysis of a "cyclopentane cut." The infrared absorption spectrum of the product to be analyzed is shown at the top. Below are given the spectra of cyclopentane and of the other possible constituents. It is seen that 2,2-dimethylbutane is the only impurity present in appreciable amount.

The infrared analysis of *n*-butane and isobutane mixtures is in routine use by at least two oil companies. The analysis (including sampling) is made by a high-school graduate and takes about 15 minutes, in contrast to 5 or more hours by the usual low-temperature distillation method. The precision is ½ per cent. A simplified spectrograph for this type of work has been developed by Brattain and Beeck.[5]

Since neither nitrogen nor oxygen absorbs in the infrared, conditions are favorable for the detection of a variety of gases or vapors in air. Fig. 3 shows the 3.4μ absorption band for various concentrations of ethane in air (in ml. per liter by volume). From this and similar records one of my students, Don Smith, prepared the working curve shown in Fig. 4. With its aid one can readily measure amounts of ethane in air smaller than one part in 20,000. The measurement takes about 5 minutes.

A problem that is only slightly more difficult is the determination of the total concentration of

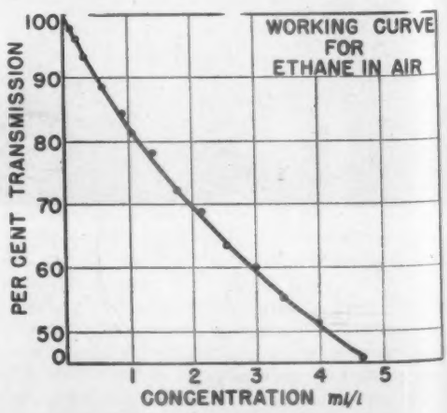


Fig. 4—Working curve for determining ethane in air

a group of homologous compounds in a compound of different structure. As an example may be mentioned the determination of paraffins in carbon tetrachloride. Fig. 5 shows a working curve, made by Smith, for determining *n*-hexane in carbon tetrachloride by its absorption at 3.41μ. Gore and Patberg[6] have recently published similar results. Amounts as small as one part per million of hexane (or the equivalent of other paraffins) can be readily detected in this way. This may serve as a basis for the determination of higher aliphatic hydrocarbons or waxes in soil samples. Almost equally simple is the use of the 6.10μ and the 4.47μ bands to determine the total amounts of olefins and acetylenes in cracked gasolines.

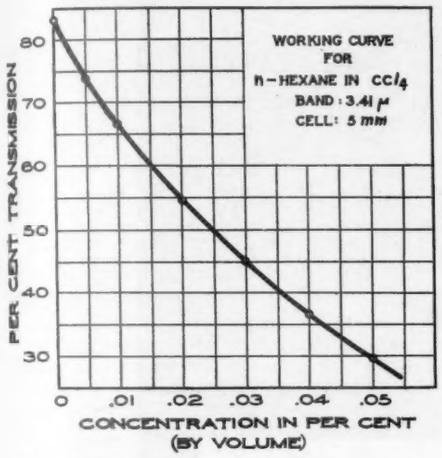


Fig. 5—Working curve for determining n-hexane in carbon tetrachloride

The analysis of a mixture of many compounds is considerably more difficult. However, methods have been worked out for analyzing mixtures of isomeric butenes and pentanes, and certain mixtures of isomeric octanes. The question of how many individual compounds can be determined in a mixture cannot, of course, be given a general answer. However, the following very rough estimate may be of interest. The vibration frequencies of the paraffins, or rather the corresponding wave numbers, lie in the regions 150-1,450 cm^{-1} and 2,700-3,000 cm^{-1}, i.e., cover a range of 1,500 cm^{-1}. If the average width of a band is 10 cm^{-1}, it should be possible to distinguish between about 150 bands. Thus, if the paraffins present in a mixture have an average of 10 characteristic bands each, it should be possible to identify and determine the concentrations of something like 150/10 = 15 different paraffin hydrocarbons.

The sharper the absorption bands are, the greater is the number of components that can be determined in a mixture. As already mentioned, the width of the bands decreases with decreasing temperature. Hence, it should be advantageous to work at very low temperatures. This conclusion has recently been verified by Avery and Ellis[7] who studied the infrared spectra of several hydrocarbons at liquid air-temperature.

Fig. 6 shows the infrared absorption spectrum of 2,2-dimethylbutane at room temperature (upper curve) and at the temperature of liquid nitrogen (lower curve). Fig. 7 shows the spectra of propylene, the two curves for each temperature corresponding to different amounts of absorbing material. The difference in the width of the bands at high and low temperatures is striking.

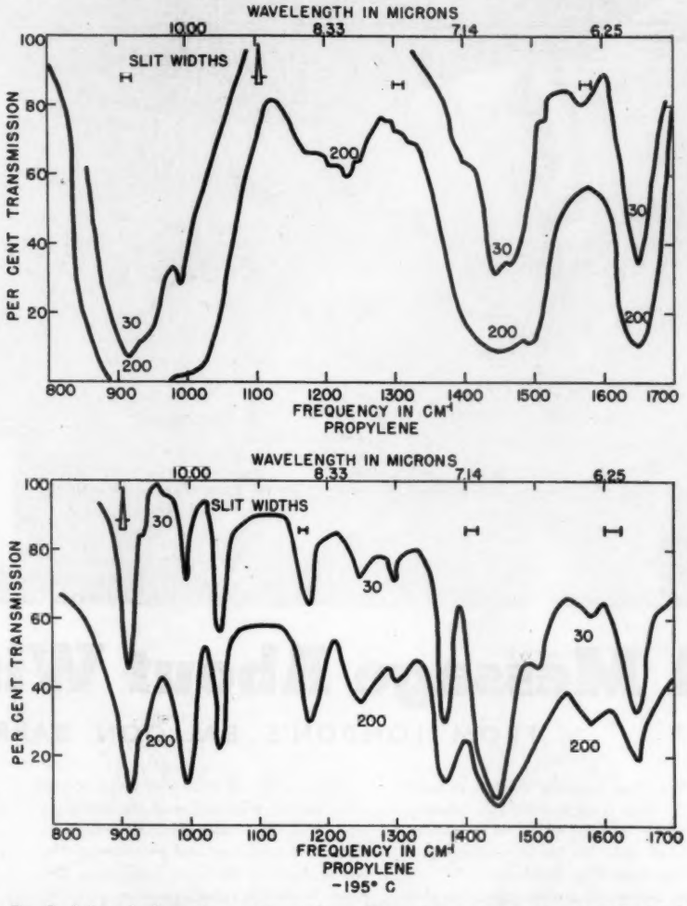


Fig. 7—Infrared absorption spectrum of propylene at room temperature and liquid-air temperature. (From W. H. Avery and C. F. Ellis, J. Chem. Phys., January 1942)

In practice, the number of components that can be determined in a mixture will depend upon the nature of the compounds, the quality of the spectrograph used, the accuracy and completeness of the spectroscopic data available for pure compounds and, last not least, upon the time and effort allowed. Many petroleum products are so complex that their complete analysis would require a prohibitive effort. However, even when they cannot be interpreted in detail, the infrared spectra of such materials may be valuable as mere fingerprints. Certainly they would serve better than any other data to differentiate between different products and to reveal any change occurring in a product.

So fare we have tacitly assumed that the infrared spectra of the compounds to be determined are already known. Actually, our knowledge of the infrared spectra of pure petroleum constituents is not very extensive; for example, very few of the olefins have yet been studied, and few of the infrared data now available are as accurate and detailed as required for quantitative analysis.

The following question is therefore of great importance: Suppose an unknown paraffin hydrocarbon has been isolated from petroleum and that its infrared absorption spectrum, as well as its molecular weight, has been determined. Is it possible from these data to determine its structure? To a considerable extent, at least, that can be done. In fact, Rose and others[8] have found that the molal absorption coefficient K of paraffins dissolved in carbon tetrachloride is a linear function of the number n_1 of methyl groups, the number n_2 of methylene groups and the number n_3 of tertiary –CH groups, i.e.,

$$K = \alpha n_1 + \beta n_2 + \gamma n_3$$

where α, β and γ are factors which are the same for all paraffins but which are different for different wave lengths. Hence, if the molal absorption coefficient of an unknown paraffin is measured for three or more wave lengths for which α, β and γ have previously been determined, it is possible to compute n_1, n_2 and n_3 for this com-

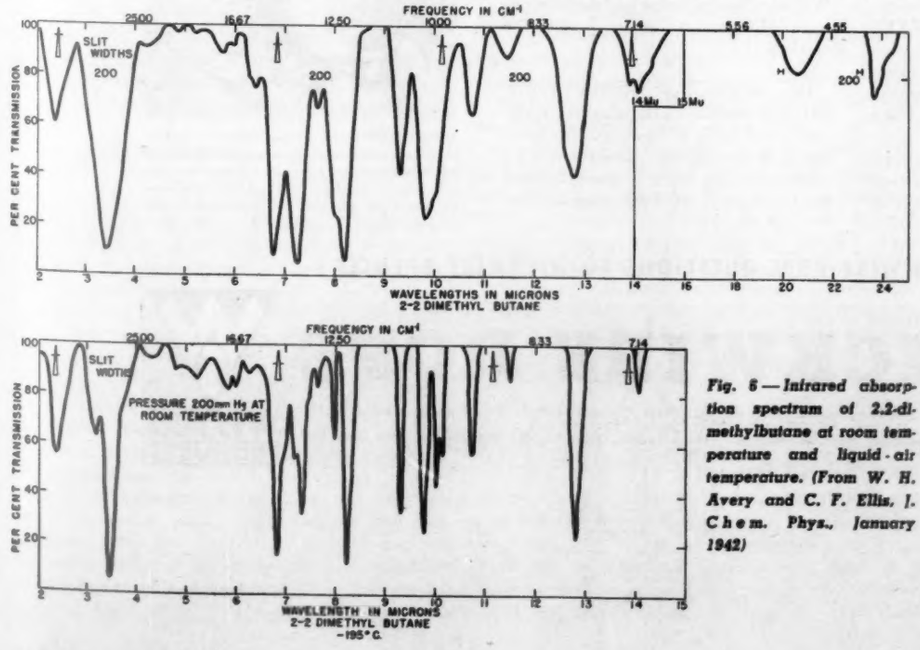
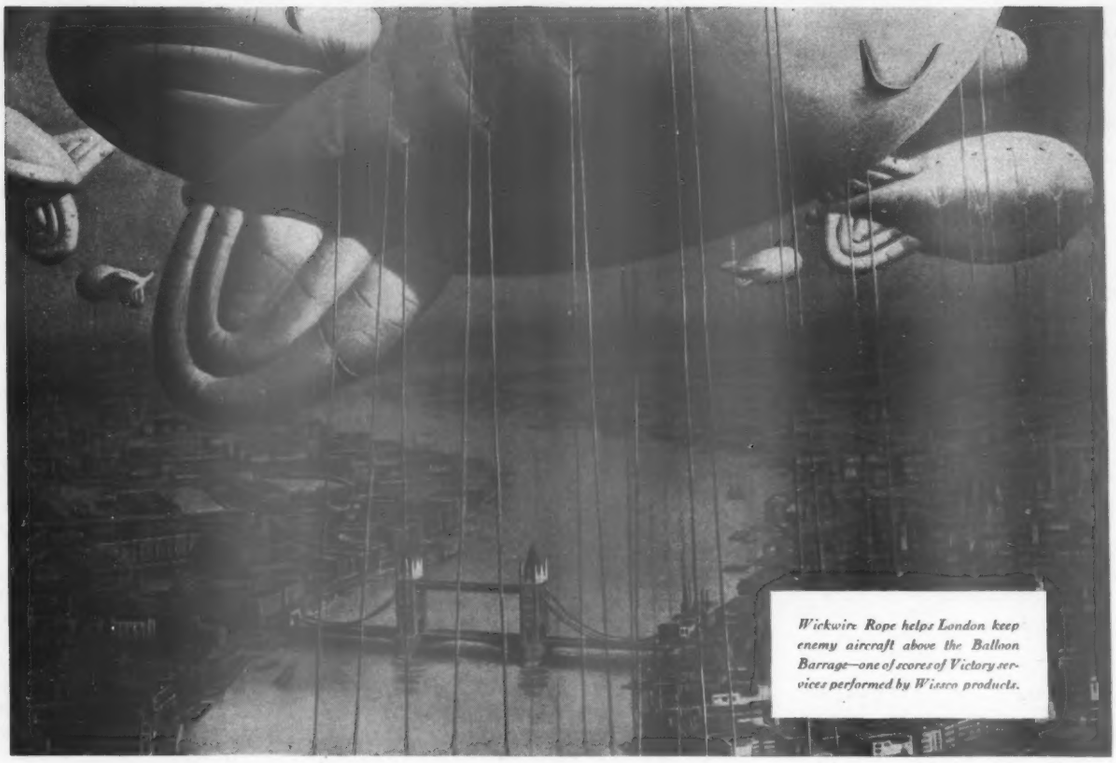


Fig. 6—Infrared absorption spectrum of 2,2-dimethylbutane at room temperature and liquid-air temperature. (From W. H. Avery and C. F. Ellis, J. Chem. Phys., January 1942)



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pound. Rose applied this method to determine the structure of an unknown nonane from absorption measurements at selected wave lengths in the region from 1 to 2μ. His result was later verified by synthesis.

Fig. 8 shows a set of curves obtained by Rose.

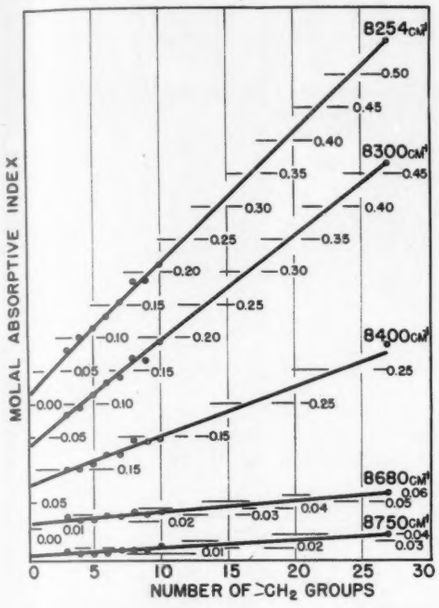

Fig. 8—Molal absorption coefficient of normal paraffins at various wave lengths in 1-2μ region, plotted against number of methylene groups in molecule. (From F. W. Rose, J. Res. Bur. Stand. 20, 129, 1938)

The molal absorption coefficient of normal paraffins for various wave lengths in the region from 1 to 2μ are plotted against the number n_2 of methylene groups in the molecule. To separate the curves, different points on the vertical axis have been used as origin for the different curves. It is seen that the curves are straight lines, showing that K is a linear function of the number n_2 of methylene groups in the molecule. This method can be used also to determine aromatic –CH groups. It has been used for identifying aromatic hydrocarbons with aliphatic side chains.

Raman spectra.—The Raman effect, i.e., the molecular scattering of light with change in frequency, furnishes another, sometimes even more convenient, means of observing the vibration frequencies of molecules. Many of the applications of infrared spectra mentioned here could have been made also with Raman spectra. There are, however, important differences between the two methods.

The method of infrared absorption is the more sensitive, only a few drops of the material being needed. It makes little difference whether the sample is gaseous, liquid or solid. The Raman method requires larger samples (say, 1 to 20 ml). While the Raman spectrum of a gas can be photographed with a fast spectrograph, the exposure time required is so long that the Raman method is limited in practice to colorless liquids and solids. Since the Raman spectrum is observed in the visible or ultraviolet, the spectroscopic equipment needed for its study is similar to that used in ordinary spectrographic analysis and less delicate than infrared equipment. On the other hand, the intensities of the Raman bands must be measured by a microphotometer after the spectrum has been photographed, whereas an infrared spectrograph gives the intensities more directly. In the Raman method the entire vibration spectrum is recorded in a single exposure on a photographic plate or film, while it is necessary to use both rock salt and potassium bromide prisms to get all the vibration frequencies in infrared absorption. Even with a potassium bromide prism, the lowest frequencies, which may sometimes be of analytical importance, usually cannot be observed. In the case of highly symmetrical molecules, such as methane or benzene, it is necessary to use both the Raman and the infrared spectrum to determine all the molecular vibration frequencies.

The Raman spectrum is frequently masked to a considerable extent by fluorescence caused by traces of high-molecular impurities in the sample. Hence, it is often necessary to purify the material before a satisfactory Raman spectrum can be obtained. No special purification is required to get the infrared spectrum. Unlike the infrared method, the Raman method can be used to study materials in aqueous solution.

The Raman effect has been applied to the analysis of petroleum products by Andant and others[9] in France, by Goubeau and Birkenbach[10] in Germany and by two or three American oil companies. The most successful applications seem to be those of Volkenstein and Shorygin[11] in Russia, and Grosse, Rosenbaum and Jacobson[12] in this country. Volkenstein and Shorygin have reported detailed results for ordinary fractions of light gasolines from three different fields. The number of hydrocarbons identified in a fraction was in some cases as high as 10, and they claim to have established the absence of a like number of compounds. Their published work is only semi-quantitative, but they have later undertaken to develop a quantitative method based on microphotometric measurements of the intensities of the Raman bands. Table 3 gives the results obtained by Volkenstein and Shorygin, as well as the results of chemical analysis, for two gasoline fractions from the Grozny field. Certainly the information furnished by the Raman effect gives a far better picture of the composition of these fractions than the chemical analysis.

TABLE 3

GROZNY 60-65° C.		GROZNY 95-100° C.	
n-Hexane	Ca. 25%	*n*-Heptane	Ca. 20%
2-Methylpentane	15	Isoheptanes	3
3-Methylpentane	7	2-Methylhexane	15
Cyclohexane	30	2,3-Dimethylpentane	4
Methylcyclopentane	5	Five-membered naphthenes	15
Unsaturates	5	Methylcyclohexane	30
Benzene	4	Toluene and other aromatics	3
Absent:		Absent:	
2,2-Dimethylbutane		3-Ethylpentane	
2,3-Dimethylbutane		2,2-, 2,4-, 3,3-Dimethylpentane	
		2,2,3-Trimethylbutane	
		2,2,3 and 2,2,4-Trimethylpentane	
Chemical analysis:		Chemical analysis:	
Paraffins	60-70%	Paraffins	30-40%
Naphthenes	30-40	Naphthenes	60-65
Aromatics	1	Aromatics	2-3

Grosse, Rosenbaum and Jacobson, who used an efficient fractionation column, were concerned only with mixtures of two or three components. Although they did not measure the band intensities microphotometrically, their analyses were generally accurate to within 5 to 10 per cent. They found this method of analysis suitable for analyzing the products of catalytic alkylation reactions.

The elimination of fluorescence is essential if the Raman method is to find wide application to the analysis of petroleum products. In some cases fluorescence can be eliminated by a slow distillation under reduced pressure in the absence of rubber and cork. In other cases, treatment with concentrated sulfuric acid, or with sulfuric acid and sulfur trioxide, breaks down the fluorescing molecules. Of course, these reagents will react with the unsaturated hydrocarbons, and to a lesser extent even with the saturated hydrocarbons, but allowance can be made for this. Catalytic hydrogenation, carried out after the aromatics and total amount of olefins have been determined, has been suggested as a means of eliminating fluorescence but has apparently not yet been fully tried. A last resort for eliminating fluorescence is to use light of sufficiently long wave length, such as yellow sodium light. If this is done, it would be advantageous to replace the present glass or liquid-prism spectographs with a grating instrument having a large grating which throws most of the light into a single order.

Before closing the discussion of Raman spectra, it may be of interest to mention that Bonino and Ansidei[13] have found a correlation between the Raman spectrum of a paraffin hydrocarbon and its octane number. This is shown in Fig. 9. The

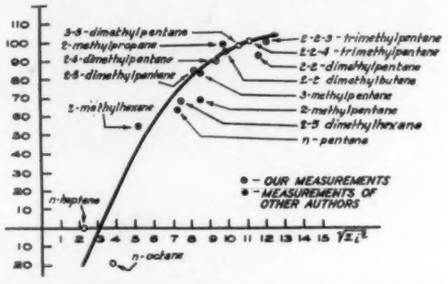

Fig. 9—Relation between octane number and raman spectrum. (From G. B. Bonino and R. M. Ansidei, Raman Jubilee Volume, Bangalore, 1938; pp. 405-418)

octane number is plotted against the square root of the sum of the squares of the intensities of the Raman bands lying between 600 and 1,000 cm^{-1}. In view of the rather large inaccuracy in the measurements of the intensities of the Raman bands, the points lie surprisingly accurately on a simple curve. This result has been confirmed by Bonino and Ansidei in a later paper but has as yet received no theoretical interpretation.

Conclusion

In conclusion, it should not be overlooked that the application of spectroscopy to problems of molecular structure may in the long run be of as great practical importance as its application to analysis. The ultraviolet absorption spectra are our chief potential source of information about excited or activated states of molecules. The infrared and Raman spectra furnish information about the forces which bind atoms together and may be used to determine the shape and symmetry of molecules. In simple cases, the hindered rotation of methyl or other groups within a molecule can be studied with the aid of these spectra. Moreover, the vibration spectra furnish data for computing the free energy and other thermodynamical properties of compounds in the gaseous state.

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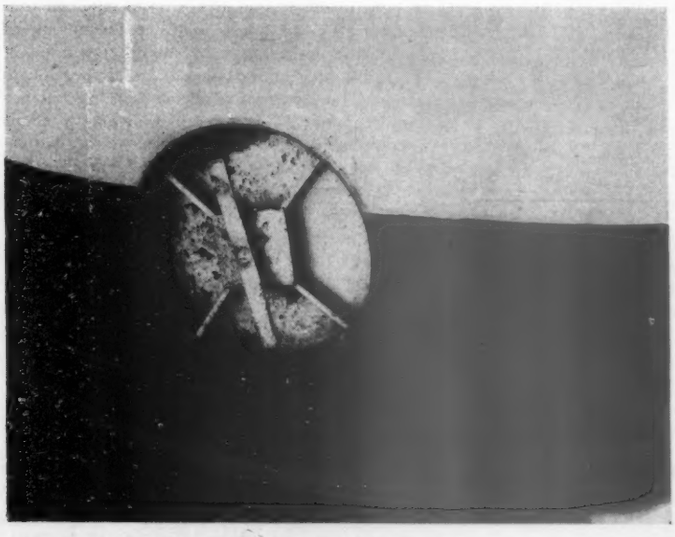
Operating Ideas

Drop-Leg Trap Mounting

The moisture trap on the steam line between boilers and rig equipment is frequently called upon to handle large slugs of water. To reduce the peak demand on the trap, one drilling contractor welds a drop-leg with a horizontal section terminating in a bull plug of orange-peel end to the underside of the line. The trap is supported by a ¾-in. strap welded on the horizontal portion of the leg. Further support for the trap is secured by welding a web of ¼-in. steel between the trap barrel and the drop-leg.



Manhole on Welded Steel Tank

Many field men contend that no tank used for the storage of oil should be built without a manhole in it. The manhole is used when cleaning the tank which has to be done more or less often depending on the field. One company has solved the problem by installing a special quick-opening manhole on its tanks. This consists of a heavy steel plate with four fins made from steel bars at 90° angles. Lugs on the recess of the tank are tapered so pressure can be applied to the cover and a seal effected. Gasket material is used between the plate and the tank.

Simplified Fence Crossing

A section of 2-in. pipe, long enough to drive to a firm support and still extend at least 8-in. above the top wire makes the crossing of fences easier for a pipe-line walker. A 1-ft. section of ½-in. pipe put through the post and welded at the proper point provides the need there to afford much assistance in getting over the fence. Still further use of the post is made by attaching to it, on the side opposite that used by the line walker, the company warning regarding the presence of a pipe-line crossing.

Floor Sheave for Counterweight Line

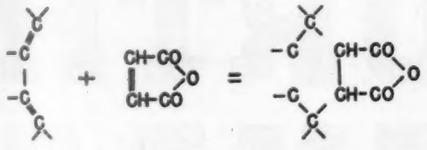
When it is desired to run the weights below the derrick floor, it is common practice to thread the line through a hole bored through a floor plank. This hole acts as a bearing and line guide. One company, finding that this practice resulted in rapid deterioration of the line, installed a small sheave at the floor. A block under the sheave allows the flanges to clear the floor. Installation of the sheave makes the tongs operate easier.

QUESTIONS ON TECHNOLOGY

Determination of Butadiene Stock for Rubber Manufacture

I am interested in obtaining an analytical method for the determination of butadiene and other similar diolefins found in refined petroleum fractions.—J. P. E.

The determination of olefins, diolefins, and other unsaturated materials should generally be more simple than the determinations of the normal or isoparaffins because of the great chemical activity of the unsaturated hydrocarbons. Although diolefinic tetrabromides are formed with ease, the most dependable method of determining diolefins is probably the Diels-Adler reaction with maleic anhydrite which is illustrated here for butadiene 1-3.



The same type of reaction appears to take place with any of the conjugated diolefins forming readily crystallizable solids. It may be possible that various anhydride end products can be separated from one another by low-temperature fractional distillation and then identified by their melting points as listed below, but it would seem that a preliminary operation by which the crude gas or gasoline was first fractionated into butane, pentane, etc., cuts, each of which would be treated with maleic anhydride, would be the most satisfactory method of identifying the various dienes.

MELTING POINTS OF ANHYDRIDE AND ACID DERIVATIVES OF THE DIENES

(Birch & Scott: Ind. Eng. Chem. 24, 49, 1932)

Material treated:	Melting points of Anhydride, °C.	Acid, °C.
Butadiene	103-104	166
Isoprene	63-64	...
Piperylene	62	
Cyclopentadiene	164-165	177-179

In connection with the preparation of butadiene from cracked gases or cracked gasolines, it would seem that only small amounts of dienes other than butadiene 1,3 would be present in the regular cut of butanes. Nevertheless, the boiling points of various hydrocarbons and dienes are given here to assist in determining which refinery cuts of gasoline or gas should be most rich in butadiene 1,3. It seems that butadiene 1,2 is an uncommon material that probably tends to rearrange into the 1,3 variety.

	B.P., °F.		
Propene	—53.7	(Propylene)	Propane cut
Propane	—44.0		
Propadiene	—20.2	(Allene)	
Isobutane	13.5		Mixed butane cut
Isobutene	20.0		
Butene 1	21.0	(Butylene)	
Butadiene 1,3	23.5	(Erythrene)	
Butane	31.0		
2,2 Dimethyl propane	49.3	(Neopentane)	
Pentadiene 1,4	78.8		Isopentane cut
2 Methyl butane	82.0	(Isopentane)	
Pentenes	68.2-101.1		
2 Methyl butadiene 1,3	94.5	(Isoprene)	
Pentane	97.0		
Pentadiene	108.5	(Piperylene)	
Other pentadienes	106-111		

Discussions of the chemistry of butadiene and other dienes can be examined in the following references: Tropsch and Mattox, "Determination of Butadiene in Gases," Ind. Eng. Chem. Anal. Ed., 6, 104, 1934; Martin, Gruse and Lowry, "Distribution of Gum-Forming Constituents in Cracked Gasolines," Ind. Eng. Chem. 25, 381, 1933; and Birch and Scott, "Identification of Diolefins in Low Fractions From Vapor-Phase Gasoline," Ind. Eng. Chem. 24, 49, 1932.

A standard method (G-17-40) for the determination of butadiene in gases has been adopted by Universal Oil Products Co., 310 South Michigan Avenue, Chicago, and it is copied here with permission of the company.

Determination of Butadiene in Gases
(U.O.P. Laboratory Test Methods)

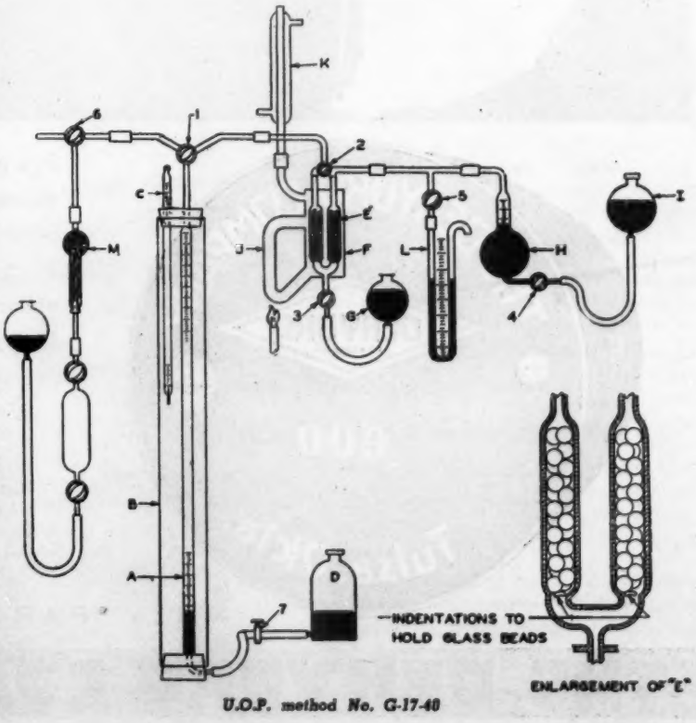
"This method permits the determination of butadiene in the presence of other gaseous olefinic hydrocarbons in amounts ranging from 0.2 to 100 per cent. Approximately 250 ml. of gas is required and a single determination can be made in 1 hour.

"Apparatus. — The apparatus shown in the accompanying sketch consists of buret *A* connected by stopcock 2 with absorber *E*, which is filled with 5-mm. glass beads, and bulb *H* with the accompanying leveling bottle *I*. A small flame under *J* maintains a circulation of boiling water through jacket *F* and around absorber *E*. Buret *A* is kept at nearly constant temperature by water jacket *B*, as indicated by thermometer *C*. Manometer *L* is connected to absorber *E* through stopcock 5. All readings are made at atmospheric pressure. A drying tube *M* is used to dry the gas as it enters buret *A* containing mercury. A vacuum pump, burner, and rubber tubing complete the apparatus.

"Reagents.—Mercury, used as a retaining medium throughout the apparatus. Maleic anhydride, a redistilled and free-of-maleic acid. Any moisture present should be removed to prevent hydration.

"Procedure.—Melt 2.0 to 2.5 grams of C.P. maleic anhydride in a shallow dish or beaker. Draw the molten anhydride into the empty heated absorber through stopcock 3 by lowering the mercury in buret *A*. Replace the rubber connection to *G* and raise the mercury until the anhydride rises to the reference point in the capillary above the jacket and below stopcock 2. By means of mercury from *I* displace all of the gas from *H*, leaving the level at the reference point at the top of bulb *H*. With buret *A* filled with mercury to stopcock 1 and the screw clamp at 7 tightened, the apparatus is ready for the admission of the gas. Evacuate the drying tube *M* and the line to the sample holder. Turn stopcock 6 and flush some of the sample into the drying tube *M*. Repeat and stop the pump. These steps are necessary to flush out the air. Admit 100 ml. of gas through *M* and measure accurately at atmospheric pressure, indicated on the manometer. Lower the mercury level in *E* to a point slightly above stopcock 3. Turn stopcock 2 to admit the gas through the maleic anhydride into bulb *H* at a rate of approximately 10-15 ml. per minute. Raise the leveling bottle *D* and lower *I*, and adjust the rate by screw clamp 7 to do this. Return the gas to buret *A* by bringing the mercury in *H* to the reference point at the top of the bulb and closing stopcock 4. Raise the mercury in *E* to the reference point below stopcock 2 and read the volume in buret *A* at atmospheric pressure as indicated on the manometer. Pass the gas back and forth through the anhydride by raising and lowering the leveling bottles until no further contraction takes place. Five or six passes usually suffice. The first analysis should be taken as a saturation pass and the same procedure followed for the final analysis.

"Precautions. — Discard the maleic anhydride when 300 ml. of butadiene has been absorbed or if more than eight passes are required in a single determination. Saturate the maleic anhydride with 100 ml. of the dry gas being analyzed and



U.O.P. method No. G-17-40

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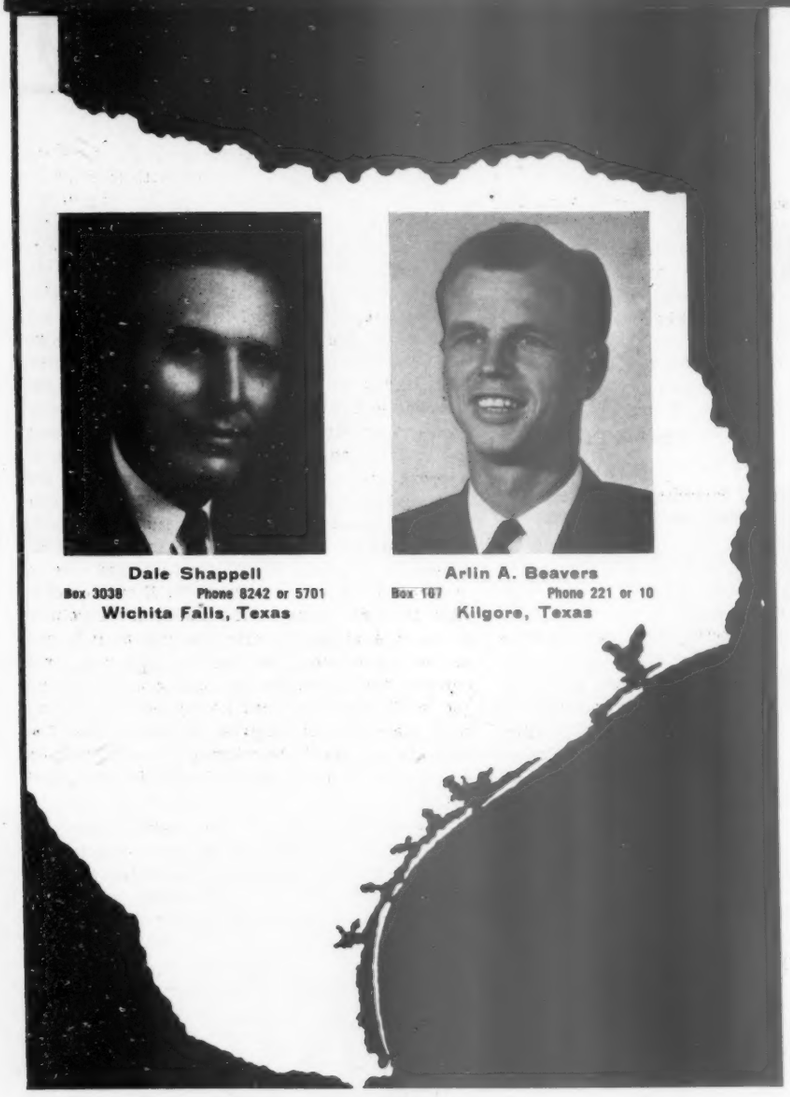

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take a fresh 100-ml. sample for analysis in each case when the butadiene concentration is different from the previous analysis. The mercury level in *H* and *E* must be brought to the same reference mark in the capillary each time. Keep the water in the jacket *F* boiling continually during an analysis. Maintain a uniform jacket temperature for buret *A* during an analysis. Dry the gas for each analysis. Moisture may cause the formation of maleic acid, which will give erratic results. Grease all stopcocks with a stopcock grease sufficiently heavy to prevent leaks.

"*Reproducibility.* — Analyses of synthetic mixtures differed by less than 1 per cent from the actual percentage. Duplicate results should agree within 0.2 per cent in gases containing less than 20 per cent of butadiene."

Butadiene can also be removed from liquid mixtures by the use of maleic anhydride (Martin, Gruse and Lowy) but other conjugated dienes are also removed. For this reason, the simplest procedure might be to gasify the butadiene by a debutanization of the liquid. Nevertheless, the method of treating liquids, as stated by Martin, Gruse and Lowy, is as follows:

"Twenty-five cubic centimeters of the fraction and 5 grams of maleic anhydride were put into a 250-cc. flask and stoppered with a cork carrying a reflux condenser; the flask and contents were heated in a water bath at 60° C. for 4 hours. During this period the flask was shaken occasionally to bring the molten anhydride and oil into better contact. After this heating period the flask was cooled to 0° C., and the liquid was decanted from the solid material and . . ."

In this operation the dienes are removed from the liquid and are found in the solid that remains in the flask. Perhaps the method could be put on a quantitative basis by developing a method of washing and weighing the maleic anhydride product.

Robey, Morrell and Vanderbilt, in "Some Improvements in Methods for the Determination of Unsaturates in Hydrocarbon Gases," which was presented (not for publication) before the St. Louis meeting of the American Chemical Society in April 1941, conclude that the maleic anhydride method is not exact if the sample contains more than 10 per cent of isbutylene, but that the use of a small amount of high-boiling primary or secondary amine with the anhydride, will correct the inaccuracy of the method.

●

Questions and Answers

I am contemplating a water flood of a property producing from the Bartlesville sand. To what extent do offset operators cooperate and to what extent do they contribute to such projects? In case they do not contribute is there some kind of cement which will prevent the migration of oil over the property lines? Could a heavy shot in an offset well open up cracks and destroy the effect of cementing? Are geological departments of colleges and state departments practical enough to guide one in the operation of secondary-recovery methods? What is the relative cost of water drive and gas drive?—W. S. C.

The extent to which offset operators contribute and cooperate on water-drive projects is determined entirely by the individual case. In many areas a pool is operated as a secondary-recovery project with all lease owners injecting water more or less simultaneously. In other cases isolated tracts are water-driven without any agreement with offset owners.

Unitization of properties has, of course, proved to be the cheapest way of water driving an entire pool and this method probably insures the greatest recovery.

If the offset owners do not want to cooperate there is no method of cementing the wells which would prevent some of the oil migrating to their properties. Even if it were possible to "directionally" cement the input wells the pressure would radiate out from the injection zone and double back across the line. The fluid in the formation will move from a zone of high pressure to a zone of lesser pressure.

A nitroglycerin shot placed in a well a short distance from an input well could very easily crack the formation and open up a channel between the two holes. This, of course, would ruin the input well and the producing well as far as water-drive purposes were concerned. Selective shooting has been used in some areas to control the movement of water through the various zones in the producing horizon, but this is another matter entirely.

Some control over fluid movement can be established by the proper drilling program and by varying the rates of injection and withdrawal. This requires study and a close check of the operation at all times.

The usefulness of state bodies and the value of their advice in handling a secondary-recovery project is variable and depends entirely on the personnel. In your particular case, you are fortunate as the Illinois Geological Survey has a number of practical men working for it. It should be pointed out that these men cannot afford to make a positive recommendation and can only mention a number of possible courses to be followed; also they can devote only a moderate amount of time to your particular case. If you desire to have a professional opinion given by a man who is responsible to you alone and who has your interest foremost, it would probably be best to hire a consulting engineer. There are a number of good men available who are experts on the subject of water flooding and gas repressuring. After making an engineering survey of the project, a consultant can determine the best course of action.

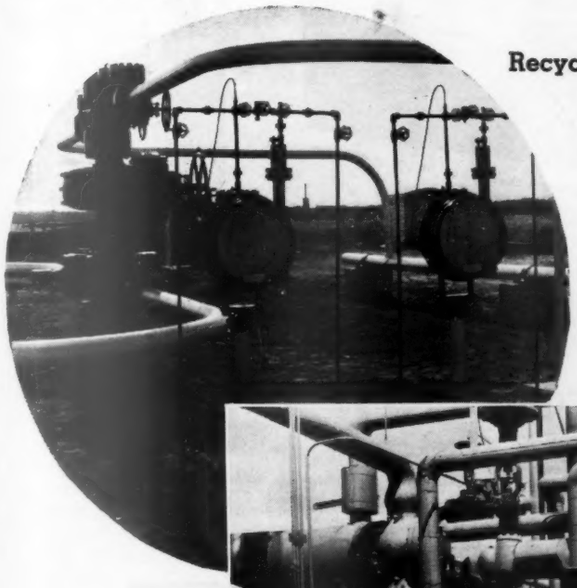
The relative cost of gas and water drive is dependent on the individual case. Generally speaking the initial investment for water drive will run from 3 to 10 times more than for gas drive. The return from the water drive is quicker and eventually the per-barrel cost of producing the oil may show only a slight difference between the two. It is easier to "feel" the way with gas drive than it is with water drive.

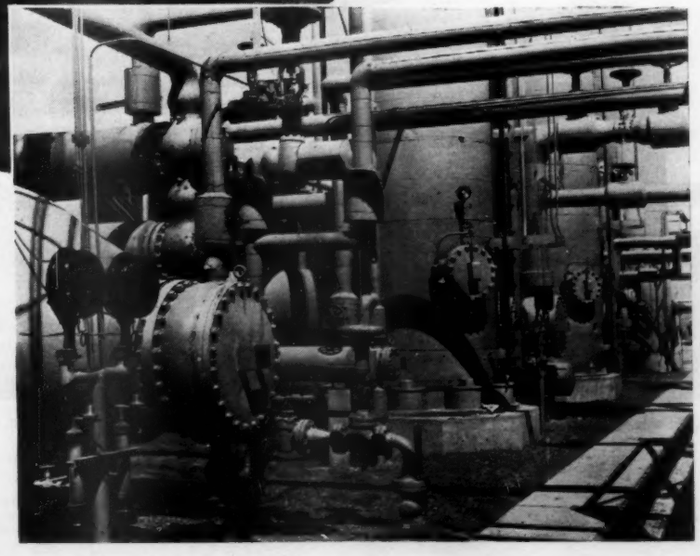
Both gas and water repressuring sound simple but the actual practice is another matter. It has taken years for the men in this work to develop present techniques and to learn the best way to proceed on different type properties. A secondary-recovery program should only be undertaken after a thorough study of the past history of these methods and after a thorough study of the property involved so needless mistakes and expense can be avoided.

One of the men talked to on this subject mentioned that he would be glad to consult with you on this project. He is a geologist and engineer named F. N. Bosco, Box 1544, Tulsa. Other qualified consultants can be found in the classified advertising pages of The Oil and Gas Journal.

Recycling Plant Instrumentation

OPERATION of recycling plants requires extensive instrumentation. The gas produced and the gas returned to the formation through the input wells must be measured. In the plant, close check must be made on the amount of gas and liquid moving through the system and a continuous record made of the temperature and pressure at numerous points.





Above: Recording meters on injection wells at La Gloria, Tex.

Right: Temperature and pressure-recording instruments in the La Gloria, Tex., recycling plant

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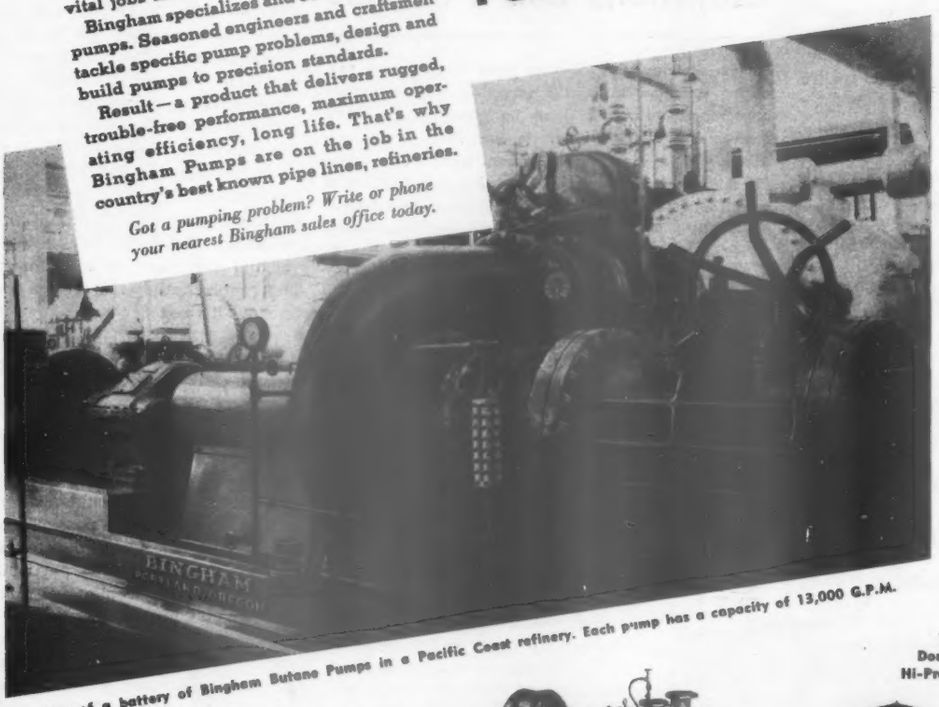

One of a battery of Bingham Butane Pumps in a Pacific Coast refinery. Each pump has a capacity of 13,000 G.P.M.

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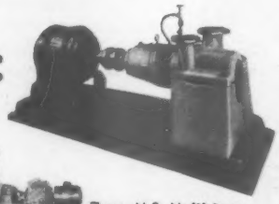
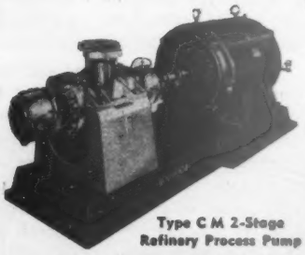
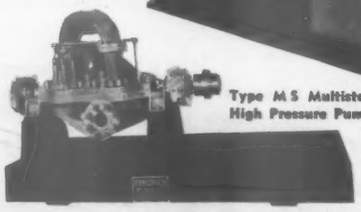
Type H P Double Case Hi-Press Pump



Type C A Single Stage Refinery Process Pump



Type C M 2-Stage Refinery Process Pump



Type M S Multistage High Pressure Pump

Type M S Multistage Oil Line Pump

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Pipe-Line Activity

Sinclair Constructs Eastern End of Pennsylvania Line

WASHINGTON, D. C.—Work on Sinclair's new gasoline pipe line from Marcus Hook to Pittsburgh, Pa., is progressing. Approximately a third of the pipe for the project has been laid along the route which lies east of Harrisburg. All of the pipe needed for construction has been delivered. The pump station at Marcus Hook is nearing completion; the Schaeffer station near Reading, Pa., is under construction.

Arkansas Natural Prepares for Pipe-Line Construction Work

Arkansas Natural Gas Co. will let contracts next week for a program which calls for the early construction of about 150 miles of line in Arkansas and Louisiana consisting of 8-in., 12-in., and 18-in. pipe.

Sohio Surveys Tinsley-Memphis Route for Proposed Pipe Line

An aerial survey for a crude-oil pipe line has recently been made for Sohio interests between the Tinsley field, Mississippi, and Memphis, Tenn. This field, which is now producing approximately 75,000 bbl. daily, has no outlets except the short lines in that locality. Standard of New Jersey interests have completed a survey on the ground for a crude-oil line from the Tinsley area to Baton Rouge, La.

Rocky Mountain Systems Complete Four Projects

Pipe-line construction last year in the Rocky Mountain area has been limited to four projects. The Mountain Fuel Supply Co. built 32 miles of 18-in. line from Leroy to a point near Granger, Wyo., as a continuation of its 60-mile 18-in. line built 2 years ago paralleling its 16-in. trunk line from the Hiawatha-Baxter Basin districts to Salt Lake City, Utah. The Billings Gas Co. constructed 21 miles of 8⅝-in. line from Garland field, Wyoming, to a connection with its Elk Basin-Billings trunk line. Goodstein, Neilson et al built a 7-mile 6-in. line from the Maverick Springs field, Wyoming, to a highway connection on the south. The Petroleum Products Corp. put into operation in December a 32-mile 4-in. line from its producing properties in the Hospah field, McKinley County, New Mexico, to Prewitt, on the Atchison, Topeka & Santa Fe Railroad, where it operates a skimming plant.

Shell Builds Terminal Facilities in Southeast

NEW YORK.—During the construction of the new Plantation pipe line from Baton Rouge, La., to Greensboro, N. C., Shell Oil Co., Inc., is erecting buildings and installing pumping equipment and tanks, with contracts amounting to more than $1,000,000 at eight pipe-line terminals on the line. These new terminals are being located at Meridian, Miss.; Birmingham, Ala.; Atlanta, Ga.; Spartanburg, S. C.; Charlotte, N. C.; Greensboro, N. C.; Chattanooga, Tenn., and Knoxville, Tenn., and are expected to be completed about the middle of 1942.

Storage facilities at these new terminals will consist of several 80,000-bbl. tanks for the storage of regular Shell gasoline, and also several 15,000-bbl. tanks, for the storage of kerosene and fuel oil. The gasoline storage tanks will be the floating-roof type, while the fuel-oil and kerosene tanks will be of the cone-roof variety.

In addition, warehouses, offices and garages are being built at all terminals, along with loading racks to accommodate tank trucks and tank cars. The main territory to be supplied by tank car and trucks from the terminals will comprise roughly the area within a 75 to 100-mile radius of the terminals. Each terminal has facilities for rail shipments.

The Plantation pipe line, in which Shell is one of the principal shareholders, is a 1,260-mile artery of 12, 10 and 8-in. pipe.

Since the area serviced by the line normally receives 89 per cent of its petroleum products entirely or in part by tankers operating from the Gulf Coast and Atlantic seaboard, completion of this project will make it possible to release between 10 and 15 tankers to shuttle or naval service.

Pipe Lines in Southwest Discussed by T. E. Swigart

In a paper presented before the Houston chapter of A.P.I. on January 14, on "The Development of Pipe-Line Transportation in the Development of the Southwest," T. E. Swigart, president, Shell Pipe Line Corp., pointed to the fact that "Pipeline technologists are busy improving methods for batching and dispatching many oils of different character through the same line. . . . These developments, together with the handling of highly volatile hydrocarbons in crude and products lines, are spurring the perfection of automatic controls and accurate meters to reduce and even eliminate the gaging of oil in tanks between the lease and the stills." This paper dealt with a wide range of subjects connected with pipe lines including history, rates, construction, operation and government regulation.

In commenting on pipe-line costs, Mr. Swigart said: "The costs of pipe-line transportation vary greatly with conditions. As in other forms of transportation, short hauls are likely to be more expensive than long ones (on a unit basis), and the qualities of oil handled--particularly their viscosities—and the size and number of tenders of different oils that may be batched in a line, all bear upon the cost of transportation.

"The outstanding factor in cost, however, is throughput. Most crude-oil lines do not operate at maximum capacity over long periods. They are built to serve oil fields, which vary in output throughout their lives. Pipe lines usually deliver to refineries directly or through supplemental carriers, and the demands of refineries also vary both seasonally and otherwise because of changing demands made upon them by their particular customers. Considering, then, that large pipe-line systems tap many fields and are thus in competition for business in almost every field, and that they generally serve more than one refinery, it is obvious that full-capacity operation is usually a fortuitous coincidence.

"There is a marginal point in the operation of each pipe line beyond which increased throughput adds but little more than the cost of the additional fuel or electric power required to pump the extra oil; consequently every pipe-line operator strives to keep his line running as near full capacity as possible. Most profit is made on the oil which can be handled above the marginal cost or at the 'bare cost of pumping'."

The closing discussion was directed to federal and state regulations which play an important part in pipe-line operation. He commented on these as follows:

"In recent years the Interstate Commerce Commission has undertaken a serious study of pipeline rates and of methods of evaluating the properties of pipe lines for purposes of making rates. The valuation of all interstate common-carrier pipe lines has been a large and complicated undertaking, probably exceeded in scope and size only by the tremendous job of evaluating the railroads.

"Investigation of Pipe-Line Rates and Practices, instigated by the ICC under its Docket 26570, culminated in an order issued in December 1940 requiring 21 pipe lines to reduce their tariffs so that in effect their net earnings would not exceed 8 per cent of 'fair value' as determined by the ICC valuations previously mentioned. This order brought protests from many carriers because by fixing what was considered a low ceiling on fair value (generally less than actual investment), there would be little incentive for carriers to risk added investments for extending their systems to new pools. Another objection frequently raised was that the new rates for various carriers, being functions of operating costs and 'fair value,' would almost never be the same for the same haul. The line with the lowest costs and fair value would receive all the business. Thus the poor lines would grow poorer while the rich lines might be swamped with traffic. The full significance of these valuation and rate studies cannot as yet be fully appraised, but they are bound to have an important effect on Texas and the Southwest because of the large pipe-line operations in this area."

Cities Service Completes Cement-Oklahoma City Line

The 53-mile 16-in. natural-gas line from Cement to Oklahoma City, Okla., for Cities Service Gas Co., was tied into the company's system near Oklahoma City at the end of last week. The line was laid by Midwestern Engineering & Construction Co. in 61 days. It is reported that working days averaged better than a mile a day.

The line cost approximately $750,000. One of the features of construction was the suspension of the pipe across the Canadian River on the bridge at Newcastle.

Cities Service has been pulling heavily on the natural-gas reserves of the Oklahoma City field, and also has been pulling gas from a "storage farm" pool near Augusta, Kans.

Capacity of the new line is 90,000,000 cu. ft. daily.

N.G.A.A. Offering to Clear Exchange of Auto Trips

W. F. Lowe, secretary of the Natural Gasoline Association of America is promoting the use of his office as a clearing house for equipment salesmen and service men whose duties cause them to make frequent visits to gasoline plants and refineries. He invites these men to call his office when a trip is in prospect and he will try to provide some means for the "doubling up" of the passengers. Mr. Lowe says the tire consumption can be substantially reduced among these men if they will take advantage of the facilities, and will unselfishly contribute cars on an equitable "give and take" basis.

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions still fail to reflect the effects of governmental drilling restrictions although they show a decline of 18 wells from the preceding week. Oil wells were down 27 while gas wells and dry holes increased by 7 and 2, respectively. From all parts of the country reports of greatly curtailed drilling indicate that within the next month drilling activity will be at the lowest point in several years. In Michigan, operators are being permitted to complete wells started before December 23, but applications for permits to drill are far below even last year's low record. Active operations reported in Illinois are down 25 per cent in a month. In this connection, it should be pointed out that in some cases, these "active" operations are far from active. Wells which have been started often are carried for many months in scout reports when they are actually shut down. Until abandoned by the operator or completed, they must be considered active.

The number of inactive wells carried in reports can not be definitely stated but they represent a fairly large proportion of drilling wells and as they are still carried in the records, the percentage drop in active drilling operations appears less than it actually is. It is conceivable that new wells starting are down by as much as 50 per cent, particularly in developed areas.

With production running nearly 700,000 bbl. a day above last January, it is obvious that more wells must be drilled if the nation's fields are not to be overproduced. It is true that the tire shortage may restrict civilian use of gasoline but this can easily be more than offset by increased export demands if the fields of the Netherlands East Indies are going to fall into Japanese hands. No official statements have been made to the effect that production should be curtailed and if it is not, it is necessary to drill at least 20,000 oil wells during the present year to maintain this rate of production. In addition, the demand for gas is increasing and more gas wells must be drilled, particularly in the East where 160-acre spacing has hardly been heard of.

Continued delay in getting an adequate drilling campaign under way may prevent the industry from maintaining its reputation of being able to satisfy any demand which can be made upon it.

MONTANA: Carter's deep test on the Baker-Glendive structure, scheduled for 11,000 ft., has been abandoned in schist at 9,678 ft. (p. 70).

ARKANSAS: A former Smackover lime producer at McKamie has been plugged back to open production from the Cotton Valley, and plugbacks are also scheduled for Dorcheat. Barnsdall's Midway discovery was gaged at 643 bbl. through 15/64-in. choke (p. 53).

NORTH TEXAS: A Strawn sand pool has been opened northeast of Nocona, Montague County (p. 60).

WEST TEXAS: A fourth Permian pay has been found in the Abell pool which also has three Ordovician pays. Walker is extended 1 mile west and Sand Hills has a prospective ½-mile northeast extension. The Andrews County discovery in the Clear Fork is being deepened after gaging an estimated 30-40 bbl. an hour. Dawson County's pool opener near the abandoned Albaugh area made 180 bbl. with some water (p. 50).

TEXAS GULF COAST: A third prospect on the Provident City-Brush Creek trend in Lavaca County is showing oil and distillate. Wildcats have opened new pools in Tyler, Jackson, Fort Bend and Houston counties and a new Frio sand section in Anahuac is showing gas and distillate (p. 63).

SOUTHWEST TEXAS. Casing is being run for a deep test in the old Carolina-Texas field, Webb County. In the same county, Yegua sand production has been found in a wildcat southeast of Mirando City. A sand, tentatively named the Chernosky, is showing oil at Government Wells (p. 69).

LOUISIANA GULF COAST: Good production has been found on the northwest flank of the old Starks dome. Exploration is being resumed at Vinton and Avery Island. Extensions to Bayou Sale make it probable that the field will eventually link with Bateman Lake to the south (p. 62).

OKLAHOMA: With increasing development of the Apache field, outlets are being provided. Some oil is being delivered to Cyril to offset declining Cement production. Wilcox oil has been found east of the Spron pool in Lincoln County. A Wilcox sand well at Guthrie has been plugged back to test the Bartlesville (p. 49).

KANSAS: Peace Creek has been extended both to the south and to the northeast by good producers. Kansas City-Lansing production has been found west of Abbyville. Saturation was found in the base of the Kansas City-Lansing and the top of the Mississippi lime in Barber County (p. 65).

ILLINOIS: Saturated Devonian lime has been found in a Jefferson County test west of Mount Vernon. An Aux Vases pool has been opened southeast of West Clay City (p. 61).

WEST CENTRAL TEXAS: A new pay has been opened in the Jim Ned pool, Coleman County, above the regular Gray sand (p. 60).

EAST TEXAS: The Midway discovery in Arkansas has started an extensive play in the counties along the Red River Valley and swinging south into Hunt County (p. 64).

CALIFORNIA: Aliso Canyon is extended to the west by a gas well. The new Turnbull Canyon field appears to be limited by an east-west fault cutting across the structure (p. 54).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended January 17, 1942)

	Oil	Gas	Dry	Total	Footage	Tll. comp. to date 1942	Tll. comp. to date 1941
N. Y., Pa., and W. Va.	86	12	7	105	212,836	324	258
Ohio	6	8	9	23	67,958	82	71
Indiana	6	2	4	12	21,383	48	19
Kentucky	6	3	0	9	7,152	39	26
Illinois	33	0	16	49	130,135	186	162
Michigan	11	1	1	13	40,513	54	42
Kansas	27	4	13	44	118,381	120	80
Nebraska	0	0	0	0	0	0	8
Missouri, Iowa	0	0	0	0	0	0	0
Oklahoma	18	3	11	32	95,728	83	84
Texas:							
North Central Texas	26	1	18	45	102,054	119	130
West Texas	43	1	3	47	195,964	128	102
Texas Panhandle	13	6	0	19	57,887	51	20
East Texas	5	1	1	7	26,436	34	60
Texas Gulf Coast	21	1	5	27	151,608	71	51
Southwest Texas	19	3	15	37	164,212	96	71
Total Texas	127	13	42	182	698,161	499	434
North Louisiana	9	2	8	19	65,186	56	29
Louisiana Gulf Coast	15	0	2	17	141,061	63	38
Total Louisiana	24	2	10	36	206,247	119	67
Arkansas	4	0	3	7	36,043	11	12
Mississippi and Southeast	0	0	0	0	0	14	9
Montana	0	0	1	1	9,678	7	20
Wyoming	1	0	0	1	3,498	4	13
Colorado	0	0	0	0	0	0	0
New Mexico	7	0	3	10	20,511	18	17
California	21	3	5	29	155,798	68	69
Total United States	377	51	125	553	1,824,022	1,668	1,469
Total previous week	404	44	123	571			
Week ended Jan. 18, 1941	295	54	115	464			

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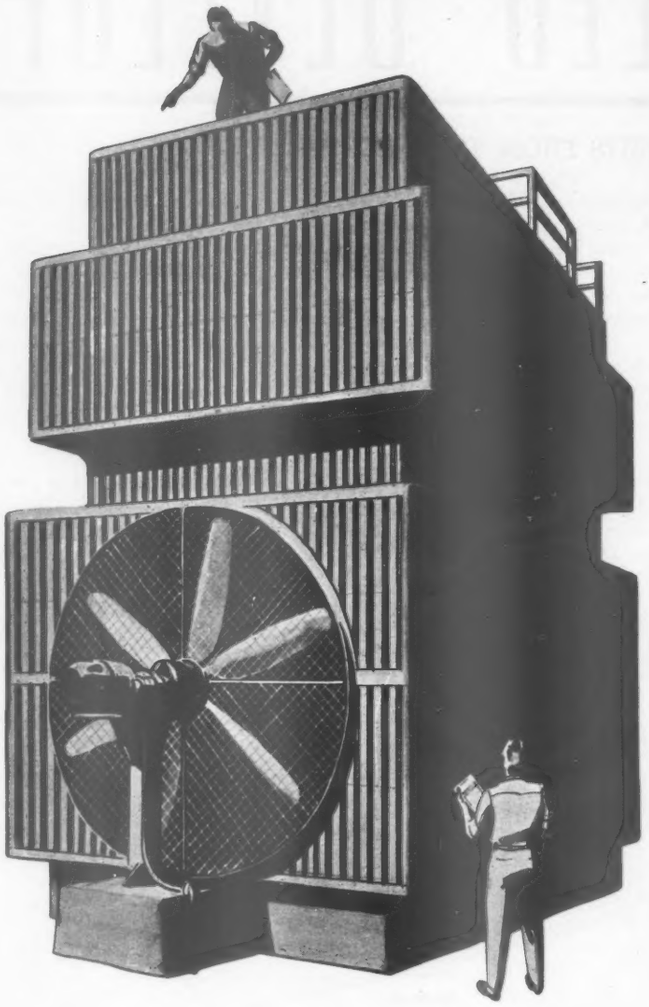

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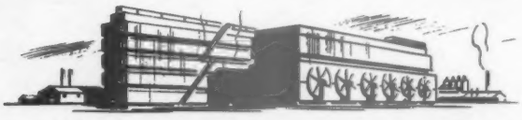

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Apache and Cement Production Obtain New Outlets

By ROBERT INGRAM

PROGRESS of the pipe-line construction program for the Apache-Cement area of Caddo County reached a point last week where an extensive drilling campaign was in order. Cement's crude-oil situation was beginning to cause some concern among both purchaser and producers as the leases were having trouble making their allowables. Early last fall deals were made for the Anderson-Prichard Oil Corp. to gather crude in the field for delivery to its refinery at Cyril, to the Rock Island Refining Co. and to the Magnolia Petroleum Co. and it was believed the field could more than meet the demand. Only seven wells were completed in Cement in December.

However, the field averaged 12,559 bbl. a day in October against a state allowable of 16,000 bbl.; in November the runs averaged 13,575 bbl. against a similar allowable, and in December runs dropped to 12,338 bbl. against a 14,000-bbl. allowable. Last week the Texas Co. began delivering 2,000 bbl. of Apache crude to the Anderson-Prichard terminal at Cyril, reportedly to make up for the inability of the Cement field to make allowables.

Meantime construction was being rushed on still another crude-oil outlet for the area—the Texas Pipe Line Co. line from Apache to the Greater Seminole area, which had reached the vicinity of Purcell—and movement of natural gas through the new Cities Service Gas Co. and Ray Stephens, Inc., line from Cement to Oklahoma City, was expected to start this week.

Completion of the gas line (see p. 45) also affected the crude production by permitting some of the big gas wells in the western end of the field to be opened up. Wells with capacity of 300,000,000 cu. ft. have been tested in the west sector, and most of these wells have made some oil. However, they have either been shut in or pinched back to a dribble because of danger of waste of the gas.

This situation has also held back drilling operations in the west end where most of the leases have been held by but a few wells, and many locations can be drilled even on a 40-acre pattern without going outside of proven area.

Apache Location Is 40-Acre Spot

Operations at the Apache pool were moving faster as outlets for production were assured (see above). Three Apache wells were included in the weekly report of completions and more were either in the pay or nearing it. Latest to be brought in was Texas Co. 4 Mulkahay, NE SE SE 2-5-12w, which gaged 497 bbl. an hour.

At the same time Texas Co. announced location for 2 N. B. Smith, NE SE NE 3-5-12w, on a 40-acre spot adjoining the Texas 1 N. B. Smith, thus indicating that future development of the pool, at least for the duration of M-68, would be on a 40-acre spacing program. All other wells in the field to date have been on a 20-acre pattern.

Extent of the field was still undetermined last week although there was some indication that the Texas 3 Mulkahay, SW NE SE 2-5-12w, might have found a faulted zone on the east flank. At 3,530 ft. it was reported the well had encountered a faulted condition, but the well was drilling ahead and operators pointed out that it would be impossible to locate formations until the Viola lime was found. In other wells the Viola has been at around 2,450 ft.

In fact the 6 Mulkahay, SW NE SE 2-5-12w, blew out during the week from gas in the Viola at 2,445 ft. and did 16,000,000 cu. ft. of dry gas a day. It was killed with mud and was to resume drilling this week. Production from the Viola proved the second gas zone for the field, the Hunton lime already having been established by the discovery well which blew out while testing the Simpson pay.

Southwestern Wildcats

Among wildcats in southwestern Oklahoma was the state's deepest drilling well, the Denver Producing & Refining 1 Sah-Cam, SE SE 33-10-10w, at Binger. This well, headed for below 15,000 ft., was drilling in shale and lime at 13,413 ft. . . . The Texas Co. 1 Reich, NW NW NE 25-4-11w, Comanche County, passed up a show of oil and gas in hard sand and was drilling ahead at 2,475 ft. A drill-stem test at 2,435-55 ft. recovered 100 ft. of mud cut with oil and gas. . . . Denver Producing & Refining 1 Luella Hayes, NE NE SW 14-4-11w, also in Comanche County, was drilling in hard black lime at 4,595 ft. . . . In Caddo County, Amerada Petroleum Corp. 1 Sprague, SE NW 11-8-12w, was drilling at 10,141 ft. . . . In Grady County, Herman Hurst of Oklahoma City started pits and cellar at 1 De Laittre, NE NW 21-9-7w, north of Pocasset, with obligations calling for a 7,000-ft. test.

Western Pottawatomie County

Exploration was spreading from the eastern half of Pottawatomie County, one of the most active oil areas of the Mid-Continent, into the western half of that county. The new area is west of the Greater Seminole district and there is a possibility that production similar to that found in this region may extend to some degree to the west.

J. F. Smith, Shawnee, and Luther Mayes, Oklahoma City, were planning to drill 1 Mullman, NW 22-10-1, and 1 Mary Mayes, NE NW 33-10-1. Sinclair Prairie Oil Co., Phillips Petroleum Co. and Mid-Continent Petroleum Corp. have offset acreage to the Mullman. In Sections 24 and 25-9-1, and 18 and 19-9-2, northwest of Macomb, Henry Brendle and Brandenberg have taken leases and may drill soon. Two other tests were being rumored in the area by major companies and leasing was active.

Lincoln County Discovery

Second pool for Oklahoma this year was opened by Fred T. Haddock and Kenneth B. Moore 1 Hart, SW NE SE 22-17-3, north of Tyron in Lincoln County. The test is 1½ miles east of the Sporn pool and a little more than a mile northwest of the new Kilmer gas field, both Skelly Oil Co. discoveries. It flowed 90 bbl. of 52.5-gravity oil and 1,750,000 cu. ft. of gas in 20½ hours from perforations in the Wilcox sand at 4,530-40 ft. Completion of the well, which found the sand some weeks ago, was delayed by a fishing job and cold weather.

Guthrie Well Plugged Back

W. C. McBride, Inc. 4 Eastwood, SE NW SW 7-17-1w, edge well on the southwestern flank of the Guthrie field of Logan County, was being plugged back to test the Bartlesville sand after exhausting production from the Wilcox sand at 5,496 ft. The well was completed in July.

Meantime Sunray Oil Co. had apparently defined the southeastern limits of the field at 8 Donoghue, SW SE SE 7-17-1w. Drilled to 5,435 ft. in the second Wilcox sand, the well showed oil and water in unestimated amounts on initial tests, and if the hole is dry, it may be plugged back to the Bartlesville sand which had a good show.

OKLAHOMA COMPLETIONS

Wildcats

Hughes County: Keener Oil & Gas 1-A Norton, NE NE NW 6-9-10, gaged 4,000,000 cu. ft. gas, 1,020 lb. R.P., Booch 2,580-2,600 ft., T.D. 3,874 ft., *discovery*.

Kay County: Skelly 1 Steve Hardesty, E½ SW SE 4-28-4, dry, T.D. 3,714 ft.

Muskogee County: France Paris 1-A Clark, S½ SE NE 32-13-19, dry, T.D. 1,202 ft.

Stephens County: Fain Operating 2 Baker-B, NE NW NE 35-2s-6w, dry, T.D. 1,945 ft.

Fields

Apache, Caddo County: Texas 6 Smith, SW NW NW 2-5-12w, flowed 50.8 bbl. per hr. for 9 hr. through ⅝-in. choke on tubing, potential 9,600 bbl., bromide 3,271 ft., sand 3,415 ft., pay 3,440-3,750 ft.

Texas 7 Smith, SW SW NW 2-5-12w, flowed 708 bbl. in 14 hr. through ⅝-in. choke, potential 7,080 bbl., Bromide 3,333 ft., sand 3,454 ft., pay 3,475-3,605 ft.

Texas 8 Smith, SW NE NW 2-5-12w, flowed 345 bbl. in 1 hr. through casing, potential 8,280 bbl., Bromide 3,393 ft., sand 3,547 ft., pay 3,573-3,726 ft.

Cement, Caddo County: Magnolia 11 Lindsay, NW NW SE 36-6-10w, pumped 41 bbl., sand 3,307 ft., T.D. 3,320 ft.

South Earlsboro, Seminole County: Amerada 7 Edwards, SW SE NE 22-9-5, pumped 215 bbl. oil and 67 bbl. water, Earlsboro 3,453-90 ft.

West Earlsboro, Pottawatomie County: Alma Oil 1 Dobbs, SW SW 18-9-5, flowed 175 bbl. oil, 6 per cent water, Hunton 4,095-4,125 ft., T.D. 4,133 ft.

Fish, Seminole County: B. Rixleben 1 Reed, SW SW SE 6-6-8, dry, T.D. 1,306 ft.

Hotulke, Pottawatomie County: Sharp 1 Hudson, NW NE NE 28-9-4, pumped 350 bbl., Viola 4,462-4,502 ft., T.D. 4,726 ft.

West Loco, Stephens County: Elko 1 Dilley, SE NE NE 7-3s-5w, dry, T.D. 499 ft.

Elm 1 Massey, SW NW NW 8-3s-5w, dry, T.D. 503 ft.

Sasakwa, Seminole County: Magnolia 3 Spillman, NW NE SE 12-6-7, pumped 13 bbl., sand 1,120 ft., T.D. 1,210 ft.

St. Louis, Pottawatomie County: Smith 1 Johnson, SW SE SW 32-8-4, location abandoned.

Tussy, Carter County: Phillips 2 McCrory, NW NE SE 5-1s-3w, pumped 140 bbl., Tussy 2,726-68 ft., T.D. 2,920 ft.

Velma, Stephens County: Karl Kiester 8 Jones-Quinn, NW SW SE 26-1s-5w, pumped 5 bbl., sand 600-65 ft.

Skelly 1 C. E. Martin, NW NW SE 36-1s-5w, pumped 5 bbl., sand 686-788 ft., T.D. 815 ft.

Weleetka, Okfuskee County: Winona 3 Hen, NW SW SE 16-10-11, flowed 122 bbl., Cromwell 2,815 ft., T.D. 2,860 ft.

Wewoka, Seminole County: Deep Rock 3 Douglas, NE NE SW 30-8-8, old well, T.D. 4,215 ft., P.B. 2,900 ft., gaged 1,000,000 cu. ft. gas.

Miscellaneous

Creek County: Sinclair 16 Berryhill, SW NE NW 16-17-12. old well, old T.D. 1,532 ft., T.D. 1,568 ft., pumped 8 bbl.

Sinclair 32 Berryhill, SW NW 16-17-12, pumped 22 bbl., Glenn 1,408-1,564 ft., T.D. 1,564 ft.

Gulf 3 Berryhill, N½ NW NE 17-17-12, old well, old T.D. 1,593 ft., T.D. 1,660 ft., pumped 8 bbl.

Burke-Greis and Deep Rock 1 Follansbee, SW SW NW 29-14-7, gaged 2,750,000 cu. ft. gas, Prue 2,849-80 ft., T.D. 2,883 ft.

Martin & Westby 1-A Groom, SW SE SE 5-14-10, pumped 225 bbl., Misener 3,260 ft., T.D. 3,281 ft.

Kay County: National Union 1 Hockman, SE NW SE 19-28-1, pumped 120 bbl., Wilcox 3,296 ft., T.D. bbl., Wilcox 3,309 ft., pay 3,324-29 ft.

McKnabb 2 Warren, NE SE NW 19-28-1, flowed 63 bbl., Wilcox 3,309 ft., pay 3,324-29 ft.

Lincoln County: Mid-Continent 1 Evans, SW SE NW 31-14-6, old well, old T.D. 4,844 ft., perf. 4,565-4,605 ft., pumped 131 bbl.

Muskogee County: W. B. Pine 1 Coffee, NW SE NW 24-13-17, dry, T.D. 3,135 ft.

Curns 1-A Welch, 5-15-15, dry, T.D. 1,333 ft.

Okmulgee County: Minschall et al 2 Lewis, SE SW NW 33-16-11, gaged 3,500,000 cu. ft. gas, sand 1,975 ft., T.D. 2,013 ft.

Sampson 2-A Sutton, SE NE NE 33-14-14, pumped 5 bbl., sand 1,196-1,207 ft., T.D. 1,221 ft.

Osage County: Stanolind 8 Osage, NW SE SW 17-27-8, dry, T.D. 2,484 ft.

(Continued on Page 67)

Seventh Pay Horizon Found In Northeast Part of Abell

By TOM BARBER

MIDLAND, Tex.—Another Permian lime pay level for the Abell pool of northern Pecos county was uncovered last week in the northeastern part of the field. The new producing formation was reported with the official completion of Siemoneit Drilling Co. 1 Walsh, Lot 11 Section 25, Block 9, H.&G.N. Survey. No. 1 Walsh flowed 264 bbl. of 36-gravity oil through ½-in. choke on tubing in 24 hours. Casing had been perforated from 3,350-70 ft. Gas-oil ratio was estimated at 1,600-1.

This new pay level makes the fourth Permian pay horizon in the field. Wells in the field are also producing from two different levels in the Ellenburger lime (Lower Ordovician) and from one horizon in the Simpson sand.

No. 1 Walsh is producing from a section of the Permian which is approximately 600 ft. higher than that found in Stanolind 1 Rathjen, Lot 14, Section 26, Block 9, H.&G.N. Survey, about 1½ miles northeast of the new producer.

Walker Pool Extended

New territory has been opened to exploration with the completion of J. D. Lancaster 3-A University, 1 mile to the west of production in the Walker sand pool of Pecos county. The extension well flowed 160 bbl. of 32.3-gravity oil in 24 hours. Production followed a 50-qt. nitro shot at 1,700-20 ft. Gas-oil ratio was 800-1.

No. 3-A University is located in the SE SE NE Section 26, Block 16, University Survey. It is about 2 miles northeast of production in the Taylor-Link field, which is derived from a lime section deeper than the Walker pool sand.

Extension for Sand Hills

Gulf 35 Waddell, C NE Section 20, Block B-26, P.S.L. Survey, indicated the possibility of extending the most northeastern section of the Sand Hills pool of western Crane county ½ mile to the north and east this week by recovering 3,500 ft. of oil on a 45-minute drill-stem test. Operator had cored from 4,464-84 ft. and recovered 10 ft. of lime carrying medium porosity and a show of oil. A second core from 4,484-4,504 ft. returned 15 ft. of porous lime with oil show. Operator then set 5½-in. casing at 4,394 ft. and ran a 45-minute drill-stem test from 4,394 ft. to bottom, during which there was a steady blow of gas and recovery of 3,500 ft. of oil.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Pecos County: Sinclair 1 J. W. Lutz, elev. 2,375 ft., dry at 4,000 ft.

Fields

Abell, Pecos County: George T. Abell 2 Eaton, elev 2,392 ft., 1,514 bbl., ½-in. choke, top Simpson 4,880 ft., top Crockett 5,165 ft., pay 5,200-69 ft.

Siemoniet Drilling Co. 1 W. T. Walsh, elev. 2,386 ft., 264 bbl., ½-in. casing outlet, pay 3,350-70 ft., P.B. from 4,989 ft., new pay for field.

Stanolind 1 Rixie-Abell, elev. 2,395 ft., 2,241 bbl., ½-in. choke, top Simpson 4,900 ft., top Tulip Creek 5,085 ft., pay 5,423-42 ft., T.D. 5,452 ft.

Stanolind 1 J. W. Fogleman, elev. 2,393 ft., 1,407 bbl., ½-in. choke, pay 5,325-45 ft., T.D. 5,354 ft.

Apco-Warner, Pecos County: Anderson-Prichard 3 Masterson, elev. 2,432 ft., 489 bbl., 23/64-in. choke, top Ellenburger 4,595 ft., 8,500 gal. acid 4,585-4,650 ft., T.D. 4,690 ft.

Olson Drilling, Co. 1-A V. W. Crockett, elev. 2,462 ft., 256 bbl., ¾-in. choke, top Ellenburger 4,455 ft., pay 4,700-80 ft.

Estes, Ward County: Mid-State 12 Llano-Sloan, elev. 2,528 ft., 102 bbl., pumping, 120-qt. shot 2,443-2,574 ft., T.D. 2,585 ft.

Texas Pacific Coal 7 James, elev. 2,536 ft., 163 bbl., pumping, pay 2,727-30 ft., old well drilled deeper.

Hendrick, Winkler County: C. V. Lyman 1-A Cowden elev. 2,818 ft., 23,460,000 cu. ft. gas, pay 2,355-2,645 ft.

Johnson, Ector County: Sinclair 32-B Johnson, elev. 2,994 ft., 1,064 bbl., 430-qt. shot 4,110-4,220 ft., T.D. 4,230 ft.

Sinclair 30-D Johnson, elev. 3,032 ft., dry at 4,250 ft.

Texas 4-X Johnson, elev. 3,001 ft., 486 bbl., pumping, 325-qt. shot 4,030-4,150 ft.

Kermit, Winkler County: Stanolind and Westbrook 4-T-88-H Hendricks, elev. 2,826 ft., dry at 3,200 ft.

Keystone (Colby sand), Winkler County: Standard 56-13 Baird, elev. 2,915 ft., 515 bbl., 425-qt. shot 3,160-3,327 ft.

McCamey, Upton County: Texas Pacific Coal 44-A Lane, elev. 2,650 ft., 72 bbl., pumping, 2,000 gal. acid 2,207-14 ft., T.D. 2,230 ft., old well drilled deeper.

North Cowden, Ector County: Broderick & Calvert 2-B Holt, elev. 3,103 ft., 386 bbl., ¾-in. choke, 97-qt. shot 4,331-62 ft., T.D. 4,370 ft.

Stanolind 79 J. M. Cowden, elev. 3,068 ft., 233 bbl., 1-in. choke, 110-qt. shot 4,140-82 ft., T.D. 4,206 ft.

Stanolind and Magnolia 5 Holt, elev. 3,064 ft., 1,764 bbl., 970-qt. shot 4,335-4,675 ft.

Shearer, Pecos County: W. H. Street 16 Shearer, elev. 2,410 ft., 146 bbl., 2-in. casing outlet, 50-qt. shot 1,429-79 ft.

Taylor Link, Pecos County: J. D. Lancaster 3-A University, elev. 2,671 ft., 106 bbl., ¾-in. choke, 50-qt. shot 1,700-20 ft.

Tobarg, Pecos County: Stanolind 17-B Smith, elev. 2,332 ft., 18 bbl. oil and 30 bbl. water, pumping, 40-qt. shot 370-85 ft., T.D. 400 ft.

Tide Water 3-T Smith, elev. 2,371 ft., 30 bbl. oil and 9 bbl. water, pumping, 50-qt. shot 390-440 ft., T.D. 506 ft.

Waddell, Crane County: Gulf 50 Waddell, elev. 2,761 ft., 10,381 bbl., 5,000 gal. acid 3,284-3,500 ft.

Walker, Pecos County: Cardinal 5-J White & Baker, elev. 3,074 ft., 100 bbl., 90-qt. shot 2,150-74 ft., T.D. 2,176 ft.

NEW WILDCAT LOCATIONS

Ector County: Texas Pacific Coal 1-B E. J. Neathery, Sec. 8, Blk. 41, T.&P. Sur., 660 ft. from N and E lines of section, 4,800-ft. rotary test.

Irion County: Staley Oil Co. 1 Sugg estate, Sec. 18, Blk. 1, H.&T.C. Sur., 660 ft. from N and W lines of section, 4 mi. NW of Mertzon, 3,500-ft. rotary test.

Andrews County Wildcat Deepening After Test

Operator continued to drill deeper at Fullerton Oil Co. 1 M. H. Wilson, northeastern Andrews County wildcat, which last week gave promise of making production from the Clear Fork lime (lower Permian). On a 45-minute drill-stem test at 7,222-7,324 ft. the wildcat flowed 37.6-gravity oil the last 10 minutes at a rate estimated at 30 to 40 bbl. per hour.

In drilling deeper, toward contract depth of 8,000 ft., operator halted at 7,720 ft. to attempt another drill-stem test but packer failed to hold. At the end of the week, 1 Wilson was drilling below 7,800 ft. with no additional shows reported. Location is in Section 12, Block A-32, P.S.L. Survey, 8 miles NW of Shafter Lake.

Dawson County Discovery

Dawson County's discovery oil producer, Ray Albaugh and Richmond Drilling Co. 1 J. J. Handley, Section 36, Block M, E.L. Survey, has been completed after a month shutdown. No. 1 Handley was completed on the pump and recovered 180 bbl. of oil plus 12 per cent water and 2 per cent basic sediments in 24 hours. Gage was taken through 2-in. tubing. Last November operator shot the test with 700 qt. of nitroglycerin at 4,910-77 ft., 3 ft. off bottom. No. 1 Handley is located about 1¼ miles northeast of Albaugh 1 John Robinson, which yielded small amounts of oil in 1936-37 when bottomed at 5,038 ft.

Lubbock County Exploration

Lubbock County will see further wildcat exploratory play in the near future with arrangements being completed for the drilling of two tests in the general area surrounding the Harrison-Nairn discovery, 3 miles northeast of the county seat. Plans are not yet complete but it is reported that Stanolind is making arrangements to drill a wildcat test about 6 miles southeast of the Nairn discovery.

The second test will be drilled 3 miles south of the discovery well by Tobe Foster. Foster and Harrison recently drilled a wildcat failure 3 miles northwest of the Harrison-Nairn well.

At the present time, there is only one wildcat drilling in the county. This test is George P. Livermore 1 Stanolind-Moxley, Section 64, Block 20, H.E.&W.T. Survey, 15 miles southwest of Lubbock. No. 1 Moxley, at last reports, was drilling below 4,105 ft., in lime, with no shows of oil or gas yet reported.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Dawson County: Ray Albaugh 1 J. J. Handley, elev. 3,086 ft., Sec. 36, Blk. M, E.L. Sur., 181 bbl. oil and 15 per cent water, pumping, 700-qt. shot 4,910-77 ft., top anhydrite 2,215 ft., top Yates 3,050 ft., top San Andres 4,580 ft., T.D. 4,986 ft.

Fields

Cedar Lake, Gaines County: Mid-Continent 1 E. Collett, elev. 3,076 ft., 485 bbl., 360-qt. shot 4,725-4,805 ft., top lime 3,860 ft., T.D. 4,818 ft.

Stanolind 3 Edith H. Johnson, elev. 3,032 ft., 582 bbl., 440-qt. shot 4,660-4,775 ft., T.D. 4,778 ft.

Iatan-East Howard, Howard County: Sinclair 77 Dodge, elev. 2,247 ft., 198 bbl., 620-qt. shot 2,623-2,770 ft., T.D. 2,780 ft.

Sharon Ridge, Mitchell County: F. W. Merrick 4 Mills, elev. 2,152 ft., 177 bbl., pumping, 680-qt. shot 1,535-1,689 ft.

Slaughter, Cochran County: Atlantic 35 Bird, elev. 3,661 ft., 135 bbl., 2-in. casing outlet, 11,000 gal. acid 4,950-5,060 ft.

Devonian Oil Co. 11-A Duggan, elev. 3,664 ft., 1,281 bbl., 2½-in. casing outlet 11,000 gal. acid 4,919-5,023 ft., T.D. 5,033 ft.

Honolulu 2-58 Dean, elev. 3,696 ft., 920 bbl., 2½-in. casing outlet, 10,000 gal. acid 4,937-5,036 ft.

Honolulu 3-58 Dean, elev. 3,695 ft., 1,375 bbl., 2½-in. casing outlet, 10,000 gal. acid 4,940-5,030 ft.

Honolulu 18-13 Igoe & Smith, elev. 3,654 ft., 985 bbl., 2-in. casing outlet, 10,000 gal. acid 4,975-5,033 ft.

Stanolind 16 Boyd, elev. 3,667 ft., 127 bbl., 7,500 gal. acid 5,023-88 ft.

Slaughter, Hockley County: Magnolia 13-E Mallett, elev. 3,596 ft., 1,450 bbl., 3-in. casing outlet, 10,500 gal. acid 4,960-5,030 ft.

Magnolia 14-E Mallett, elev. 3,600 ft., 1,739 bbl., 3-in. casing outlet, 10,500 gal. acid 5,000-35 ft.

Rowan Drilling Co. 4 Mallett, elev. 3,579 ft., 1,043 bbl., 14,000 gal. acid 4,927-5,009 ft.

Skelly 1 W. R. Shultz, elev. 3,563 ft., 395 bbl., 3-in. casing outlet, 7,500 gal. acid 4,880-4,940 ft.

Texas 21-E Mallett, elev. 3,594 ft., 1,662 bbl., 11,500 gal. acid 4,980-5,023 ft.

Texas 75 Slaughter, elev. 3,540 ft., 1,300 bbl., 12,000 gal. acid 4,905-5,010 ft.

Texas 77 Slaughter, elev. 3,572 ft., 1,214 bbl., 13,000 gal. acid 4,955-5,015 ft.

Texas 79 Slaughter, elev. 3,517 ft., 673 bbl., 4,500 gal. acid 4,932-4,987 ft.

Texas 83 Slaughter, elev. 3,568 ft., 2,742 bbl., 14,000 gal. acid 4,980-5,043 ft.

Texas Pacific Coal 4 Graham, elev. 3,542 ft., 715 bbl., 3-in. casing outlet, 10,000 gal. acid 4,910-71 ft.

Tide Water 3 Slaughter, elev. 3,579 ft., 443 bbl., 9,000 gal. acid 4,865-4,959 ft.

Wasson, Yoakum County: Shell 1 M. F. Lackey, elev. 3,563 ft., 496 bbl. oil and 8 per cent water, 10,000 gal. acid 5,235-5,323 ft.

West Andrews, Andrews County: Likins & Hall 2-B University, elev. 3,177 ft., 1,197 bbl., pay 4,295-4,335 ft.

NEW WILDCAT LOCATIONS

Dawson County: Magnolia 1 Lillian Scanlin, Sec. 113, Blk. M, E.L. Sur., 660 ft. from S and E lines of N½ of section, 4,970-ft. rotary test.

New Lea County Pool Opened; Maljamar Active

HOBBS, New Mex.—Indicating opening of a new producing spot in western Lea, slightly more than 4 miles north of the Halfway pool, Culbertson & Irwin, Inc., and Southern California Petroleum Corp. 1 Beulah V. Lynch logged pay in Ieu

(Continued on Page 65)

New Zone Pays At McKamie; Midway Rules Awaited

By R. MARNE SANFORD

SHREVEPORT, La.—The first commercial production from the Cotton Valley series of the lower Marine was opened in the McKamie field of Lafayette County the past week. Closely following this discovery, the announcement was made that an old Smackover lime well in the Dorcheat field was scheduled for a plugback in an attempt to establish oil production from the Cotton Valley in that field.

The McKamie field discovery is Carter Oil 1 Cornelius, center of NE Section 30-17-23, which was originally completed from the deep Smackover lime several months ago. Declining production was believed to have prompted the plugback. It was perforated opposite the Cotton Valley zone from 7,255-65 ft. with 28 shots and came in flowing by heads at the estimated rate of 15 to 20 bbl. hourly. There was about 15 per cent water with the fluid output. Flow was through ¼-in. choke and the oil was 35 gravity. At the close of the week the water volume had increased to exceed the oil output, but this was attributed to a faulty squeeze job. Preparations were under way to squeeze off the lower part of the perforated section and make another test early the coming week.

At Dorcheat Atlantic Refining Co. is moving in materials to plugback and test its No. 1-B Pinewood Lumber Co., SE NW Section 16-18-22. The well is a former Smackover lime producer which has become practically depleted. It offsets a failure drilled early in the development of the field. Log on the test to be plugged back showed approximately seven different sands in the Cotton Valley series, all of which carried some shows of oil and gas.

Barnsdall Discovery Completed

Official completion was recorded for the Smackover lime discovery well of the Midway pool in Lafayette County by Barnsdall Oil Co. It is 1 Bond, NW SW Section 11-15s-24w. It gaged 643 bbl. daily through casing perforations from 6,340-70 ft. and the total depth was 6,536 ft. The flow was through 15/64-in. choke with tubing and casing pressures of 830 lb. and 750 lb., respectively. The gas-oil ratio was 257 to 1. Tests showed the bottom-hole pressure to be 2,810 lb. at 6,300 ft., while the bottom-hole temperature at the same depth was 180° F.

The following tops were reported and released with the well's completion: Midway 507 ft., Arkadelphia 914 ft., Nacatoch 1,057 ft., Saratoga 1,436 ft., base chalk 1,770 ft., top Massive anhydrite 3,140 ft., base Massive anhydrite 3,275 ft., top James 3,710 ft., base James 3,770 ft., top Travis Peak 4,025 ft., Buckner 6,152 ft., Smackover lime 6,296 ft., porous lime 6,314-78 ft., tight lime 6,378-6,424 ft., and porous lime 6,424-6,536 ft.

The field hearing to determining field rules and spacing pattern will be heard the coming week. Some 15 drilling permits have been applied for in the area, but work is still held up pending the hearing and field rules.

ARKANSAS COMPLETIONS

Wildcats

Clark County: Coker Oil 1 Rudolph, NE SW 26-10s-18w, dry at 877 ft., total depth.

Howard County: DeGrazier 1 Dierks Lbr. Co., SW SW 7-8s-28w, dry at 1,410 ft., total depth.

Lafayette County: Barnsdall Oil 1 E. S. Bond, NW SW 11-15s-24w, 643 bbl. daily, perf. casing 6,340-70 ft., total depth 6,536 ft., Smackover lime 6,296 ft., porous lime 6,314-78 ft., tight lime 6,378-6,424 ft., porous lime 6,424-6,536 ft., discovery of Midway pool

Fields

Atlanta, Columbia County: Tide Water-Seaboard Oil 4 J. T. Beene, SW NE 15-18s-19w, 519 bbl. oil, 8,209-20 ft., total depth.

Buckner, Lafayette County: G. Scott Hammond 2 McKean, SW NW 8-16s-22w, 104 bbl. oil and 79 bbl. water, 7,316 ft. total depth.

East Schuler, Union County: Atlantic Ref. 1-B Bishop, NE SE 14-18s-17w, dry at 5,831 ft.

Atlantic Ref. 1 Mason, SE SW 13-18s-17w, 125 bbl. oil, perf. casing 5,568-76 ft., 5,853 ft. total depth.

Third Test May Explain North Louisiana Structure

The deep 11,880 ft. gas discovery in the Lisbon field last week still held attention in this area. The hole has been reconditioned and the mud heavied and further drilling was under way as the week closed. It is Union Producing Co. 1 McDonald, Section 15-21-5, the second test to find gas and distillate in the deep Smackover lime of the area.

It has been definitely established that the gas at 11,880 ft. in this well is from the Smackover lime and that the well is some 1,600 ft. lower, structurally, than the same company's 1-A

(Continued on Page 66)

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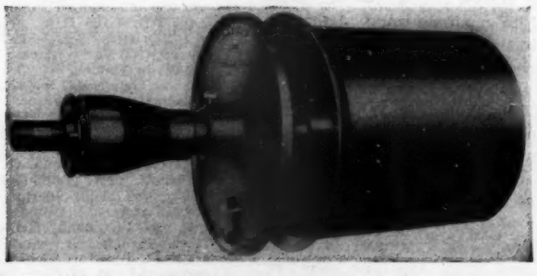

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CALIFORNIA FIELD REPORT

Five-Mile West Outpost at Elk Hills Completed As Gas Well

By L. P. STOCKMAN

LOS ANGELES, Calif.—Standard Oil Co., which is drilling a number of new wells in the Elk Hills field for its own account to establish property values and an additional group of wells for the Navy Department, completed one of the latter's outposts in 19-30s-23e as a gas well early last week. This outpost is about 5 miles west of the Hay-Carman section of the Elk Hills field, Kern County, and for this reason is regarded as of considerable importance.

The well in question is 24-19-R and since it is being drilled for the Navy Department is a no-dope hole. This means that no information of any kind is being officially released. However, based on a drill pipe count, the well was drilled to about 6,475 ft. and then plugged back to about 2,830 ft. It is not known whether any oil was found in the bottom of the hole as it is not customary to produce new wells by the Navy Department in the Elk Hills Naval Reserve. The Navy Department is content to core the oil sand and then suspend operations and move to another location for additional drilling. The new well completed several days ago is estimated to have produced at a daily rate of approximately 10,000,000 cu. ft. of gas. No data is available as to the size of the flow bean but it is assumed that it was probably between 24/64-in. and 32/64-in.

There are two producing areas in the Elk Hills field with about 5 miles of intervening, undrilled, but potentially productive oil land. Standard Oil Co. in cooperation with the Navy Department is determining the status of this acreage. It has been generally believed by engineers familiar with the field that the Hay-Carman area and the area to the east will ultimately be found to be one major field. The eastern segment has been quite well defined to the north, south and east.

Until recently the known productive oil measures were confined to a single zone about 250 ft. thick, occurring in the Etchegoin formation, or at its contact with the overlying Paso Roble formation. During the past year, however, Standard Oil Co., as a result of its exploration program has probably proved up the existence of a second zone. There is every reason to believe that the productive horizons of the two segments of Elk Hills may be correlated and, if this proves true, the productive area of the field will doubtless include the intervening section as well as other areas to the north and west. The gas zone in which Standard Oil Co. this week completed 24-19-R is probably the equivalent of the Mya gas zone that has been found productive in other San Joaquin Valley fields.

San Joaquin Valley Operations

There was no special change during the past week in the status of wells under way in the several new fields discovered in the San Joaquin Valley during 1941 but several drilling projects are nearing the completion stage. In the Jacalitos field of Fresno County, Wilshire Oil Co. is rigging up pumping equipment on its second well and should have this well finished within another few days. In the Helm field of Fresno county, Amerada Petroleum Corp. is nearing the pay in 5-27, the company's second well in this field which it discovered.

Conditions in the Raisin City field are still confusing and it appears quite probable that some of the locations staked for early work will have to be changed in order to conform with the one well to 40-acre spacing program. The result of work to date on Barnsdall's Ripperdan in 24-15s-17e indicates the lenticular condition of subsurface formations and especially the oil measures. This well is located only about three locations away from one of Shell's producing wells and yet it failed to find the Seaboard zone productive. Barnsdall has additional acreage north of this lease but has not yet made any decision whether to undertake any further drilling for the present.

SAN JOAQUIN VALLEY COMPLETIONS

Belridge North, Kern County: Belridge Oil Co. 55-26 fee, 26-27s-20e, flowed 75 bbl., 51.6-gravity, 0.5 per cent cut, 7,766,000 cu. ft. gas, 64/64-in. bean, T.D. 10,800 ft., P.B. 8,025 ft., perf. 7,860-8,020 ft., top Temblor 5,110 ft.

Coalinga Northeast, Fresno County: Standard 57-19-B fee, 19-19s-16e, flowed 132 bbl., 29.1-gravity, 4 per cent cut, 1,564,000 cu. ft. gas, 8/64-in. bean, T.D. 8,247 ft., perf. 8,226-46 ft., Gatchell sand 8,072-8,247 ft., upper part blanked off account of gas.

Elk Hills, Kern County: Standard 260-35-S, 35-30s-24e, pumped 279 bbl., 26.9-gravity, 0.3 per cent, T.D. 2,965 ft., perf. 2,844-2,964 ft., Scalez sand 2,840-2,965 ft.

Standard 2113-35-S, 35-30s-24e, pumped 118 bbl., 24.1-gravity, 2 per cent cut, T.D. 2,937 ft., perf. 2,781-2,930 ft., Scalez sand 2,799-2,937 ft.

Greeley, Kern County: General Pet. 1 Hammer, 12-29s-25e, flowed 1,005 bbl., 38.7-gravity, 1.1 per cent cut, 1,100,000 cu. ft. gas, 20/64-in. bean, T.D. 11,500 ft., perf. 11,459-99 ft. in Rio Bravo.

Kern Front, Kern County: Carrec Oil Co. 8 Kern, 11-28s-27e, pumped 70 bbl., 15.1-gravity, 40 per cent cut, T.D. 1,890 ft., perf. 1,683-1,890 ft. in Tegeler zone.

Kettleman North Dome, Kings County: K.N.D.A. 36-2-P, 2-22s-17e, flowed 190 bbl., 47.2-gravity, 46 bbl. water, 10,000 cu. ft. gas, 32/64-in. bean, T.D. 9,780 ft., perf. 9,515-9,775 ft. in McAdams zone.

K.N.D.A. 341-20-Q, 20-22s-18e, flowed 200 bbl., 48.9-gravity, 24 bbl. water, 10,200,000 cu. ft. gas, 28/64-in. bean, T.D. 9,975 ft., perf. 9,683-9,970 ft., in McAdams zone.

Mount Poso, Kern County: Ring Oil Co. 2 Vedder, 28-26s-28e, abandoned in Vedder zone, gray and barren, T.D. 1,485 ft.

Shell 3 Griffiths fee, 5-27s-28e, pumped 60 bbl., 14.7-gravity, 30 per cent cut, T.D. 1,865 ft., perf. 1,802-65 ft., in Vedder.

D. G. Vedder 7 B.N.B., 32-26s-28e, pumped 350 bbl., 15.8-gravity, 0.2 per cent cut, T.D. 1,670 ft., perf. 1,645-70 ft., in Vedder sand.

Rio Bravo, Kern County: Superior 7 Pasadena Realty, 33-28s-25e, flowed 1,590 bbl., 40.5-gravity, 1 per cent cut, 1,700,000 cu. ft. gas, 32/64-in. bean, T.D. 11,440 ft., perf. 11,386-11,440 ft., in Rio Bravo sand.

Rio Vista gas field, Sacramento County: Standard 3 Perry Anderson, 2-3n-2e, flowed 16,924,000 cu. ft. gas, 48/64-in. bean, T.D. 4,460 ft., perf. 4,327-4,459 ft., in Emigh gas zone.

Standard 2 Bradford Comm., 20-3n-3e, flowed 16,780,000 cu. ft. gas, 48/64-in. bean, pressures 1,450/1,450 lb., T.D. 4,272 ft., cleaned out to 4,270 ft., perf. 4,030-4,270 ft., in Emigh gas zone.

Ten Section, Kern County: Shell 64-29-A Kern County Land, 29-30s-26e, flowed 621 bbl., 36.2-gravity, 0.5 per cent cut, 641,000 cu. ft. gas, 18/64-in. bean, T.D. 8,235 ft., perf. 8,046-8,232 ft., in Stevens oil sand.

Shell 44-30-A Kern County Land, 30-30s-26e, flowed 449 bbl., 34.4-gravity, 3 per cent cut, 288,000 cu. ft. gas, 16/64-in. bean, T.D. 8,200 ft., perf. 8,036-8,197 ft., in Stevens oil sand.

Turnbull Canyon Fault May Limit Size of Field

Drilling operations by Continental Oil Co. in the Turnbull Canyon field, which it discovered in Los Angeles Basin during 1941, indicate the productive acreage of the field will be smaller than anticipated. Within the past 2 weeks the company drilled through a fault in 2 Turnbull Community and failed to find the productive zone. This second well in the Turnbull Canyon field was carried down to 3,792 ft. and then plugged back to 1,900 ft. to facilitate redrilling. The bit is at present rotating ahead slightly below 2,000 ft. and is being whipstocked to the north.

The company's second well failed to correlate with the discovery well and its failure to find the pay was not entirely surprising although this fault was not thought to be of any great consequence when drilling operations began. As a result of this development, it looks like the potentially productive acreage of the Turnbull Canyon field may be cut in half. The fault which prevented 2 Turnbull Canyon from getting the pay extends in an east-west direction and apparently hades to the south.

Permits Stopped at Wilmington

Until conditions are further clarified the Fire Commission and the Harbor Commissions of Long Beach and Los Angeles will not accept any additional applications for permits to drill new wells in the Wilmington field. The state Division of Oil and Gas, Department of Natural Resources, is still accepting notices of intention to drill new wells and undertake other work and will continue to do so as it has no authority to deny any operator the privilege of drilling if he complies with requirements.

The state legislature can, if it so chooses, make changes in the regulations but this will require a change in the statutes under which the Division of Oil and Gas functions. The division, by the way, has received 58 notices of intention to drill during the first 10 days of January compared with 27 at the same time last year. Priorities, however, along with provisions of M-68, will prevent the starting of these wells for the present.

Potrero Completion Unusual

Tide Water Associated Oil Co. completed a good well in the Potrero field of Los Angeles Basin this week when 5 Cypress was brought in flowing 325 bbl. of clean 46.9-gravity oil. Flow was through a 14/64-in. bean so that the well's potential is subsequently larger than its initial. The Potrero field contains a number of relatively thin oil sands throughout several thousand feet and operators have enjoyed good success during the past year in landing pipe and then perforating at preselected points. Tide Water, however, landed 7-in. casing at 5,476 ft. and followed up in the conventional manner with a 5-in. liner to take care of a 50 ft. zone.

LOS ANGELES BASIN COMPLETIONS

Dominguez, Los Angeles County: Union 72 Callender, 29-3s-13w, flowed 829 bbl., 32.3-gravity, 3 per cent cut, 1,146,000 cu. ft. gas, 64/64-in. bean, T.D. 7,400 ft., redrilled to 7,390 ft., perf. 6,737-7,388 ft., this well, which was killed by earthquake several months ago, was recompleted after redrilling job.

Potrero, Los Angeles County: Associated 5 Cypress, 34-2s-14w, flowed 325 bbl., 46.9-gravity, 0.5 per cent cut, 400,000 cu. ft. gas, 14/64-in. bean, T.D. 5,526 ft., perf. 5,472-5,526 ft., in second Potrero zone.

Rosecrans, Los Angeles County: Barnsdall 10 O'Dea, 18-3s-13w, flowed compressor 67 bbl., 33.2-gravity, 40 per cent cut, T.D. 7,664 ft., P.B. 6,959 ft., perf. 6,169-84 ft., 6,191-6,295 ft., 6,329-56 ft., 6,385-6,406 ft., 6,777-91 ft., 6,799-6,866 ft., recompleted in equivalent of sixth Callender zone.

Barnsdall 7 Trust, 18-3s-13w, flowed 140 bbl., 31.6-gravity, 15 per cent cut, T.D. 8,589 ft., P.B. 8,565 ft., perf. 7,833-7,938 ft., 8,013-8,182 ft., 8,271-8,354 ft., 8,389-8,558 ft., completed in lower O'Dea zone of Miocene age.

J. P. Getty 4 Athens, 7-3s-13w, flowed 150 bbl., 32-gravity, 1.2 per cent cut, 128/64-in. bean, pressures 50/100 lb., T.D. 8,100 ft., perf. 7,761-8,095 ft., completed in equivalent of O'Dea zone of Miocene age.

Wilmington, Los Angeles County: Hoover, Morse & Steele 3 Harbor, 32-4s-13w, pumped 125 bbl., 17.1-gravity, 10 per cent cut, T.D. 3,727 ft., perf. 3,020-3,392 ft., 3,592-3,637 ft., 3,677-3,727 ft., completed in Ranger zone.

A. D. Mitchell 1 Liggett, 29-4s-13w, pumped 175 bbl., 17.8-gravity, 2 per cent cut, T.D. 3,700 ft., perf. 3,030-3,310 ft., 3,465-3,699 ft., completed in Ranger zone.

Royalty Service Corp. 6-B Nelson, 33-4s-13w, pumped 90 bbl., 17.2-gravity, 75 per cent cut, T.D. 3,524 ft., redrilled to 3,505 ft., perf. 2,698-2,774 ft., 2,933-3,001 ft., 3,161-3,203 ft., 3,413-3,503 ft., redrilled

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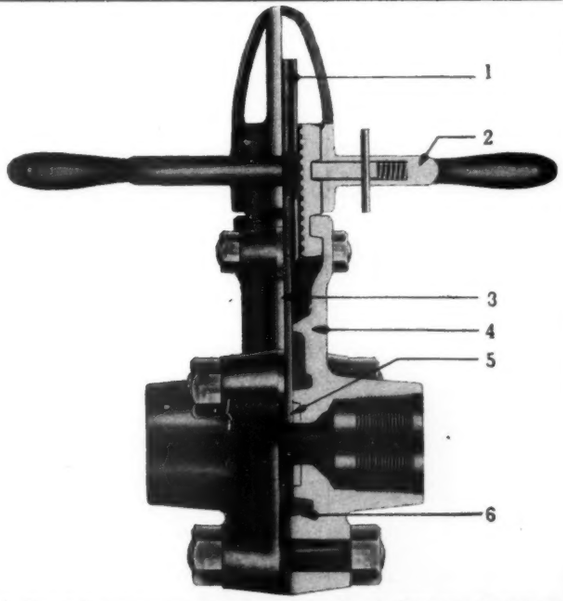

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from 2,707 ft. to 3,507 ft. and returned to production in Ranger zone.

Selegna Pet. Corp. 15 Harbor, 33-4s-13w, pumped 102 bbl., 14.9-gravity, 2 per cent cut, T.D. 3,557 ft., perf. 3,224-3,553 ft., completed in Ranger zone.

Union Pacific R. R. 86 fee, 3-5s-13w, flowed 59 bbl., 21.9-gravity, 0.1 per cent cut, 128/64-in. bean, T.D. 3,559 ft., 60-mesh perf. 2,571-2,629 ft., 2,643-87 ft., 2,707-96 ft., 3,086-3,147 ft., 3,466-3,551 ft., redrilled and deepened from 3,542 ft. and returned to production in Ranger zone.

Union Pacific R. R. 215 fee, 3-5s-13w, flowed 232 bbl., 30.7-gravity, 4 per cent cut, 48/64-in. bean, pressures 50/500 lb., T.D. 4,414 ft., P.B. 4,290 ft., 60-mesh perf. 3,965-4,045 ft., 4,060-4,110 ft., 4,125-82 ft., 4,197-4,284 ft., completed in lower Terminal zone of Miocene age. upper Terminal perf. at 3,022-3,135 ft., 3,173-3,237 ft., 3,695-3,788 ft., not open to production.

Wilmith Pet. Co. 1 Community, 32-4s-13w, pumped 51 bbl., 14.6-gravity, 3 per cent cut, T.D. 3,705 ft., perf. 2,990-3,100 ft., 3,155-3,270 ft., 3,480-3,570 ft., 3,660-3,704 ft., redrilled and deepened from 3,696 ft. and recompleted in Ranger zone with gravel pack.

Gas Well Extends Aliso Canyon Field

Tide Water Associated Oil Co. extended the productive limits of the Aliso Canyon field to the west this week by completing 26 Porter although this well proved to be a gas well instead of producing crude oil. The most interesting feature in connection with the completion of this new well is the fact that the pay was found at about the same depth at which it was found in 12 Porter which was finished about 2 years ago. This new well is producing from the lowest producing member in the Aliso Canyon field but with additional favorable formations below present production it is logical to assume that additional productive sands will be ultimately found at greater depth.

The industry is closely watching the outcome of drilling on 1 Ward which Universal Consolidated Oil Co. took over several months ago after another operator had drilled about 7,000 ft. of hole and then abandoned. Universal has cored some good looking sand and shale since starting deepening operations but is still probably above the deep Porter zone found by Tide Water Associated Oil Co. The Aliso Canyon field presents a very rough topography and in some spots is practically inaccessible. In addition, the structure appears badly faulted and broken up on the surface.

Drilling Suspended in Newhall Field

For the first time since its discovery, there is not a single drilling well under way in the Newhall-Potrero field of Los Angeles County as Barnsdall Oil Co. shut down 29 Rancho San Francisco until authority is granted to proceed. This well was spudded in on January 2, 1942, on the assumption that the verbal ruling on M-68 was valid. When it was found that the order actually prescribed that a well must have been making hole on December 23, 1941, drilling operations were suspended.

The Santa Maria Valley field, which took a renewed life again a few months ago, will feel the full effect of the coordinator's ruling as there are a number of locations staked and derricks standing. It was the intention to start many of these wells early in the new year but these plans must now be changed. Production in the Santa Maria Valley field along with other producing areas in the coastal district has been severely reduced due to disrupted transportation, especially marine movements. Marketing companies are very reluctant to move tankers into these open ports without naval protection and for this reason it is quite probable that the coastal district fields will be forced to either shut down entirely or greatly reduce production.

COASTAL DISTRICT COMPLETIONS

Aliso Canyon, Los Angeles County: Associated 26 Porter, 28-3n-16w, flowed spray of 51-gravity condensate and 15,000,000 cu. ft. gas, 30/64-in. bean, pressures 2,000/2,500 lb., T.D. 7,844 ft., perf. 7,608-7,843 ft., completed in third Modelo zone of Miocene age.

(Continued on Page 61)

APPALACHIAN FIELDS

Eastern Field Work Hit Hard by Spacing Order

PITTSBURGH, Pa.—Reviewing the lower eastern fields for the past week, it is difficult to determine whether the extremely cold subzero weather retarded operations as much as did OPM Order M-68. On the scout reports, some operations are shut down—cold weather—whereas many new tests which had not spudded in bear the notation, shut down—OPM M-68.

With a large part of Pennsylvania Grade crude now being refined for every defense angle, the subzero weather caused runs from wells in the lower fields to drop off over 1,000 bbl. a day, much of which will not be regained until the spring thaws. How much vitally needed crude and gas will be lost to defense by Order M-68 is hard to determine.

Southwest Pennsylvania Tests

On Chestnut Ridge in South Union Township, Fayette County, the Greensboro Gas Co. deepened the test on the Barton estate and struck another chert pay in the Onondaga which increased the gas volume to over 2,500,000 cu. ft. gas. No present depth is available and the last recorded was 7,237 ft.

Here, the New Penn Development Co., William E. Snee et al topped the Onondaga chert at 6,505 ft. in the No. 4 on the Heyn (Summit Hotel) which places it the highest on structure of the entire pool which will increase interest in it. Drilling stopped at 6,511 ft. where 7-in. casing will be run. These operators are having difficulty in the test on the Kirby estate with caves and on a crooked hole with the bottom after cementing redrilled to 6,305 ft. It is probable that casing will be run at this point. Their No. 1 Carothers will remain shut down waiting on Peoples Natural Gas Co. 4 Piedmont which evidently is on the downthrow side of a fault with a large thrust as at 7,902 ft. the Lower Devonian has not been placed.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County: Burrell Township: J. K. Sharp, Tr. 2 Lottie Manners, 107,000 cu. ft. gas, Hundred-foot sand 1,256-1,327 ft., gas 1,290 ft., T.D. 1,450 ft.

Clarion County, Monroe Township: Owens Illinois 1 J. H. Kuhns, dry, through Tiona, T.D 2,926 ft.

Greene County, Wayne Township: Manufacturers Light & Heat 1 Ira L. Stewart, 2,225,000 cu. ft. gas, Big Injun sand 2,065 ft., gas 2,158-2,165 ft., T.D. 2,165 ft.

Indiana County, Washington Township: T. W. Phillips 1 Streams & Sanner, 11,000 cu. ft. gas, Bradford sand, T.D. 3,489 ft.

WEST VIRGINIA COMPLETIONS

Boone County, Crook district: Hope Natural 7662 E. M. Arbogas, small gas well in the Brown shale, casing collapsed, plugged and abandoned, T.D. 4,813 ft.

Braxton County, Birch district: Pittsburgh & West Virginia 7401 G. B. Howell, drilled deeper, 763,000 cu. ft. gas, Big Injun 1,944-2,058 ft., Squaw 2,019-2.021 ft., gas 1,995-2,005 ft., gas 2,018-21 ft., T.D. 2,059 ft., former depth 1,453 ft.

Calhoun County, Sherman district: Coral Poling 2 Coy Robinson, 5 bbl., Injun sand, T.D. 1,985 ft.

Clay County, Buffalo district: Pittsburgh & West Virginia 7795 Elk River Coal & Land Co., 2,000,-000 cu. ft. gas after shot, Big lime 2,108 ft., T.D. 2,209 ft.

Pleasant district: Thompson Gas Co. 43 Thompson L. & C. Co., drilled deeper, 169,000 cu. ft. gas. Big lime 1,851-1,990 ft., Big Injun gas, T.D. 2,035 ft.

Gilmer County, Troy district: F. G. Bish 4 B. S. Messenger, gas well, Big Injun sand 1,575-1,667 ft., gas 1,640 ft., T.D. 1,680 ft.

Hancock County, Grant district: R. J. Braden Co. 14 J. H. and A. Ward, 2 bbl., Berea sand, T.D. 1,097 ft.

Kanawha County, Washington district: Owens, Libby-Owens 1 E. D. Spillman, 129,000 cu. ft. gas after shot, Big lime 1,397-1,598 ft., gas from Brown shale, T.D. 3,739 ft.

Lincoln County, Jefferson district: Cambridge Gas Co. 1 S. V. Mullins, drilled deeper, 641,000 cu. ft. gas after shot, started 2,215 ft., Brown shale 3,300-20 ft., 3,500-15 ft., 3,530-66 ft., shot 2,968-3,566 ft., T.D. 3,566 ft.

(Continued on Page 68)

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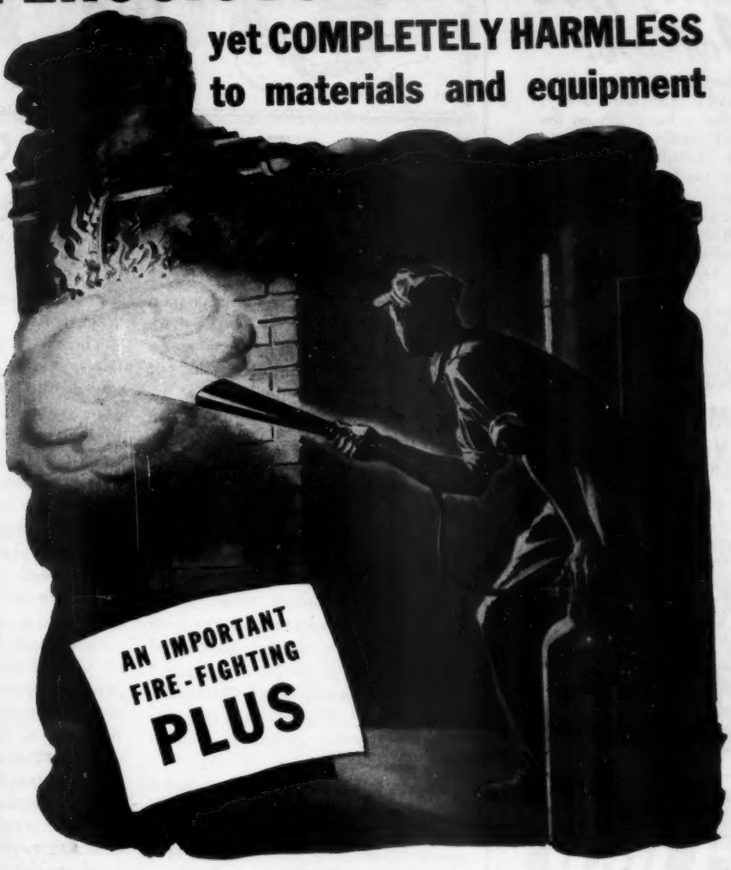

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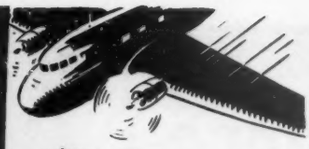

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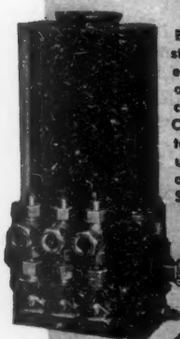

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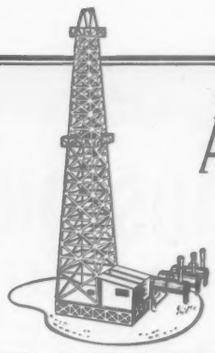

Among the Drilling

Revenue Bureau Issues Opinion to Allow Deduction of Contract Sums

FORMAL NOTIFICATION has been given the petroleum industry that it may deduct from income sums paid independent contractors for the drilling of oil wells on a footage basis. Permission to continue deductions of footage-contract payments was extended last week in an opinion prepared by J. P. Wenchel, chief counsel, Bureau of Internal Revenue.

The decision was a reversal of instructions issued to tax collectors by the bureau following recent decisions of the U. S. Board of Tax Appeals. The bureau in the past has permitted deduction of such drilling expenses, but recently held that such sums should be treated as capital expenditures.

The chief counsel summarized the conditions which will form the bureau's new policy in taxing drilling as follows:

1. Payments to a contractor under a "turnkey" contract as defined by the cases cited as controlling are capital expenditures, though the contract may be also a "footage" contract.

2. Costs incurred by operators under a "footage" contract, which is not also a "turnkey" contract, represent intangible drilling and development costs which may be charged to expense under the option.

3. Payments to a contractor under a contract that is neither a "turnkey" nor a "footage" contract are capital expenditures if the contractor is an independent contractor; but may be charged to expense under the option if the contractor is an employe or agent of the operator rather than an independent contractor.

4. All intangible drilling and development cost incurred in drilling and development carried on by operators through employes or agents are within the option.

Mr. Wenchel's conclusions were based on certain legal considerations in test cases which are summarized as follows:

In Old Farmers Oil Co. v. Commissioner (12 B.T.A. 203), acquiescence, C. B. VII-2, 30 (1928), amounts paid contractors in accordance with "turnkey" contracts under which "the contractors furnished all casing, fuel, and materials, and turned over the completed wells to petitioner for a stipulated price" were held not deductible under the option, the board stating that "payment for wells when completed bear no resemblance to payments for wages, fuel, repairs, hauling, etc."

The distinction drawn by the cited decision has been consistently followed by the board in subsequent cases. Amounts paid to a contractor under a "turnkey" contract have been consistently disallowed as expense items under the bureau practice.

"In the 1932 restatement, it was expressly stated that 'drilling and development costs shall not be excepted from the option merely because they are incurred under a contract providing for the drilling of a well to an agreed depth, or depths, at an agreed price per foot or other unit of measurement.' In the case of I. Rudman v. Commissioner (36 B.T.A., 803), acquiescence on this point, C.B. 1938-1, 26, the board apparently regarded the quoted language as permitting amounts paid to a contractor under a 'footage' contract to be treated as deductible expenses under the option; provided the contract is not a 'turnkey' contract as defined by the board decisions. That decision also makes it clear that a contract is no less a 'footage' contract because it recited a total stipulated lump sum consideration for drilling to a depth of 2,950 ft. instead of an agreed price per foot."

There remains for discussion the status of payments under contracts which are neither "turnkey" nor "footage" contracts as those terms are defined above which was the question presented to and decided in the recent cases of Retsal Drilling Co. v. Commissioner (42 B.T.A., 1057, acquiescence, C.B. 1941-1, 9) (appeal pending C.C.A. 5) and W. D. Ambrose v. Commissioner (42 B.T.A. 1405, nonacquiescence, C.B. 1941-1, 12) (appeal pending C.C.A. 5). Under the contracts involved in the Retsal case, the contractors did not agree to furnish all material and labor needed. Under one contract the operator agreed to furnish "fuel, water, storage tanks, and connections." In the other contract the operator agreed to furnish "water, fuel, tanks, flow lines, and a man to supervise the drilling of the sand area and the running of the casing, and also to swab in the wells."

The amounts paid to the contractors in the Retsal case were held not to be intangible drilling and development costs, the board saying:

. . . the contracts here were not contracts for the employment of labor and the purchase of supplies, material, and equipment. The relationship between the parties was not that of employer and employe, but that of independent contractors. The petitioner did not hire labor or buy materials and supplies, but agreed to pay an independent contractor a stated sum for a finished job, leaving it to the contractor to make his own deal for labor and equipment, and the fact that the petitioner may have furnished some of the supplies and some items of equipment does not change the contracts so as to bring any portion of the amounts paid to the contractors within the provisions of article 23(m)-16.

Such a rule is confirmed by the board's decision in Ambrose v. Commissioner, supra. In that case the contracts were "cost-plus" contracts. The board distinguished that case from the Retsal case by stressing features of the contract which it believed established the employer-employe relationship between the operator and the driller, and concluded that payments made by the operator were direct expenditures of the operator for intangible drilling and development costs under the pertinent regulation. Such decisions show that in the opinion of the board payments made to an independent contractor under a contract which is neither a "turnkey" or "footage" contract, as those terms are defined above, are not within the option, while payments to an employe or agent of the operator are within the option.

●

BOSWORTH Drilling Co., Odessa, Tex., is moving rotary to southeastern Sterling County, Texas, where a wildcat well will be drilled for Steve C. Currie. Location is on the Harris estate, 660 ft. from the north and west lines of Section 129, Block 6, H.&T.C. Survey.

ASHBY Drilling Co., Mount Pleasant, Mich., has moved two rotary rigs from the Reed City field to Ludington and assigned them to drilling Sylvania brine wells for Dow Chemical Co.

HARRY L. EDWARDS Drilling Co., Houston, Tex., drilling for the Cities Service Oil Co. in the Thornwell area, Jefferson Davis Parish, is run-

Contractors

ning tubing for a production test at 10,319-21 ft. If successful, the test will open the first field of the year in South Louisiana. Along the Texas Gulf Coast sector two rotaries were running in the St. Charles and North La Ward fields for Continental Oil Co. and Harrison & Abercrombie.

MANAHAN Drilling Co., recently opened Gulf Coast operating offices in Houston, Tex. James E. Boyd is in charge.

HERNDON Drilling Co., Great Bend, Kans., has assigned rotary to location for 2 Hagen, SE NW SW 20-20s-11w, Barton County, Kansas.

BRUNSON Drilling Co., Great Bend, Kans., has moved a rotary to western Rice County, Kansas, for a test 2 miles northeast of the Brandenstein field. Location is on the Ringwald farm, CNL NW 32-18-10w.

RU-MAR Drilling Co., Vincennes, Ind., has resumed operation of its rig on the Morlock farm in Posey County, Indiana, where a test is being drilled at NW SE NW 26-7s-14w. Waltersburg sand at 1,971 ft. carried a noncommercial showing of oil.

HOUSTON Drilling Co., Houston, Tex., is starting a new operation in the Mauritz area, Jackson County, Texas, for J. G. Mayo et al where 1 Rodesney was completed the previous week to open a new field for the county.

NELSON Drilling Co., Great Bend, Kans., has started drilling 1 Sayres, NE NE SW 36-19s-6w, Reno County, Kansas.

BUTLER & HORNE, drilling contractors of Dallas, Tex., are preparing to start a new Jones County, Texas, wildcat, 6 miles north of the Noodle Creek field. The 3,300-ft. test will be known as 1 Minter and is located in the southeast corner of Section 39, Block 8 in the S.P. Survey on a 2,300-acre tract.

WRIGHT Drilling Co., Dallas, Tex., is planning a Woodbine sand test in southwest Anderson County, Texas, on a 430-acre O. G. Rogers tract in the William Greenwood Survey. Drilling is expected to start by March 24.

FRED J. WHITE, Paw Paw, Mich., has taken contract to drill Thomas Fensom 1 Johnson, SE SE SE, 10-4n-13w, Allegan County, Michigan.

GOLL, GRAVES & MECHLING, Inc., Saginaw, Mich., has been awarded contract for Kirkham-Kales Co. 1 John Fisher, C E½ NE SE 29-14n-8e, Tuscola County, Michigan.

C. N. HOUSH, president, and C. N. THOMPSON, vice president, of Housh & Thompson, Inc., Houston, Tex., contracting firm, announced last week that the company had been dissolved, and that hereafter they would operate in partnership as Housh & Thompson and as Housh & Thompson Drilling Co. The partners have one rotary running in the Caplen field, Galveston County, Texas, for J. H. Snowden, one in La Fourche Parish, Louisiana, for E. Cockrell and another in Fort Bend County, Texas, where distillate production was opened in the Rosenberg area for the Placid Oil Co.

LANG & LEWIS, Holland, Mich., have received contract for Michigan Devonian Petroleum Co. 1 Harbolt, NW SW SW 15-1s-14w, Van Buren County, Michigan.

W. L. GOLDSTON, Houston, Tex., has apparently opened a south extension to the Needville field, Fort Bend County, Texas, as preparations were being made to test 1 A. Smith. Casing was cemented below 5,200 ft. after drill-stem test at 5,183-90 ft. recovered pipe-line oil.

CLARK & COWDEN, Dallas, Tex., contractors and producers, have staked location for a wildcat in the Danevant area of Wharton County, Texas. Rotary rig is to be moved to the Kountze farm, C SW NW Section 85, E.T.R.R. Survey.

ROWAN Drilling Co., Houston, Tex., continues to test 1 W. H. Land, a new pool opener south of the Anahuac field in Chambers County, Texas. The well was drilled jointly with the Nichols Oil Co. Other operations are reported in the Venice field, Plaquemines Parish, Louisiana, for the Tide Water Associated Oil Co.

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R. O. Galbreth, driller; John N. Anderson, contractor; F. W. Shanks; W. E. Creighton, driller, and Bryan Litchfield. This crew is pictured in the Oklahoma City field where Mr. Anderson operates well-servicing rigs and does contract drilling work

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NORTH CENTRAL TEXAS

Strawn Sand Discovery Near Holt Pool Makes Good Flow

By D. H. STORMONT

WICHITA FALLS, Tex.—A new Strawn sand oil pool was opened during the week 10 miles northeast of the town of Nocona in Montague County. The pool discovery is Gibson & Jennings 4 Howard, Block 90, Kaufman C.S.L. Survey, which has been in the completion stage for some time.

On official gage, 4 Howard flowed 85.7 bbl. of oil in 3 hours, through ½-in. choke on tubing, with no water reported. Operator had perforated casing opposite the Strawn sand section at 3,931-40 ft. No. 4 Howard was last tested several weeks ago and since that time has been shut in.

The new discovery is 3¾ miles southeast of the shallow Hott pool, which produces from a section of the Strawn around 2,000 ft. No. 4 Howard is in an area in which the operators have drilled three other tests, but these were all shallow holes and were found to be dry.

Archer County Wildcat

The 5,000-ft. wildcat test being drilled by Continental at 1 W. P. Ferguson, located in Block 9, S.P. Survey, 3 miles southwest of Holliday in Archer County, encountered a slight show of oil in the K.M.A. lime of the Strawn section this week as it drilled toward the Caddo lime.

No. 1 Ferguson topped the K.M.A. lime at 4,038 ft. and drilled lime showing oil from 4,053-68 ft. Operator then cored from 4,068-77 ft., set packer at 4,063 ft. and attempted to run a drill-stem test. However, packer failed to hold and had to be reset for a second attempt, which was successful. With tool open 30 minutes, a drill-stem test from 4,063-77 ft. recovered 60 ft. of oil-cut mud.

A second drill-stem test was made after 1 Ferguson had been drilled to 4,180 ft. This test, a 20-minute drill-stem test, was run from 4,165-80 ft. and returned 110 ft. of gas-cut mud with a rainbow of oil. At the end of the week operator was drilling ahead below 4,246 ft.

Meanwhile, initial tests were being made on a prospective discovery in Jack County. Roeser & Pendleton 1 Webb, Middleton Survey, 5 miles northeast of Perrin, flowed 61 bbl. of oil and 90 bbl. of salt water in 18 hours through open 2-in. tubing from 2,895 ft.

Clay County Test Plugged Back

The Clay County wildcat of Superior at 1 Scaling, 3 miles south of Haskell, is preparing to test a sand section at 3,630-50 ft. after plugging back and perforating casing. No. 1 Scaling, located in Section 2, H.T.&B. Survey, Abstract 882, was drilled to 5,865 ft. in the Ellenburger lime, which it topped at 5,810 ft.

NORTH TEXAS COMPLETIONS

Wildcats

Young County: Kerlyn Oil Co. and Phillips 1 E. C. Garvey, Sec. 4, G.B.&N. Sur., A-19, 197 bbl. in 4 hr., ¾-in. choke, est. 40 bbl., top Caddo 4,275 ft., top Ellenburger 5,381 ft., 3,000 gal. acid 4,281-4,310 ft., T.D. 5,436 ft.

Fields

Antelope, Clay County: Shell 16 A. Coburn, Sec. 2606, T.E.&L. Sur., 70 bbl. in 8 hr., est. 150 bbl., pay 3,232-36 ft.

Shell 7-C J. G. Mullens, Sec. 2604, T.E.&L. Sur., 54 bbl. in 24 hr., top Caddo 5,086 ft., top Ellenburger 6,102 ft., 2,000 gal. acid 5,451-80 ft., T.D. 6,168 ft.

Shell 3 L. S. Wright, Sec. 2625, T.E.&L. Sur., 87 bbl. in 8 hr., est. 200 bbl., 10-qt. shot 3,175-82 ft.

Hull-Silk, Archer County: J. A. Chapman 6 L. F. Wilson, Sec. 23, A.T.N.C.L. Sur., 63 bbl. in 6 hr., est. 150 bbl., 5,000 gal. acid 3,768-3,812 ft., T.D. 4,010 ft.

Jack, Jack County: George E. Weber 6 W. H. Peterson, J. B. Irvine Sur., A-312, dry at 364 ft.

K.M.A., Archer County: C. H. Staley 23 Anna Mangold, Sec. 30, R. Castleman Sur., A-681, dry at 1,800 ft.

K.M.A., Wichita County: Murchison & Wynne 2 Big Wichita River Bed, Wichita River bed, 247 bbl. in 2 hr., ¼-in. choke, est. 975 bbl., top K.M.A. 3,628 ft., top Caddo 3,806 ft., 1,500 gal. acid 4,137-4,232 ft.

Perry Browning 9 C. J. Simpson, Sec. 33, K.W.V.F. Sur., 65 bbl. in 24 hr., pumping, pay 1,764-72 ft.

Perry Browning 2-B C. J. Simpson, Sec. 33, K.W. V.F. Sur., 50 bbl. in 24 hr., pumping, pay 1,770-78 ft.

Tide Water 14 W. P. Ferguson, Sec. 1, W. H. Spillers Sur., A-257, 214 bbl. in 3 hr., ¾-in. choke, est. 750 bbl., top K.M.A. 3,671 ft., top Ellenburger 4,276 ft., top Caddo 3,884 ft., pay 3,892-4,362 ft.

Shell and Phillips 41 N. C. Griffin, F. Jordan Sur. A-167, 282 bbl. in 3 hr., ¾-in. choke, est. 1,250 bbl., top K.M.A. 3,726 ft., top Ellenburger 4,352 ft., 2,000 gal. acid 3,942-4,380 ft.

E-C Oil Co. 25 Anna Mangold, Sec. 35, P. Castleman Sur., A-35, 297 bbl. in 5 hr., est. 650 bbl., top K.M.A. 3,770 ft., top Ellenburger 4,339 ft., pay 4,341-75 ft.

Throckmorton, Throckmorton County: Humble 3 Allie McKnight, Sec. 2, D.L.&C. Sur., A-1264, dry at 4,765 ft.

Owenwood Pool No. 3 20 A. M. Housley, Sec. 28, Comanche Indian Reservation Sur., dry at 1,035 ft.

Cross & Peterman 2 Harrell, B. M. Stroud Sur., A-1282, dry at 970 ft., old well drilled deeper.

W. Neustadt 2-A W. M. McKeichan, D. T. Yates Sur., A-1129, dry at 756 ft.

R. F. Gillman 5 Susie Tutan, Sec. 2, A. J. Kemp Sur., A-1369, dry at 960 ft.

T. C. Jones 1 H. A. Wilhelm, Sec. 651, T.E.&L. Sur., dry at 757 ft.

R. F. Gillman 2 Susie Tutan, A. J. Kemp Sur., A-1369, dry at 775 ft.

Voth, Cooke County: Whitfield & Grimes 1 C. I. Fette, D. H. Campbell Sur., A-196, dry at 1,765 ft.

Walnut Bend, Cooke County: Magnolia 18 Ramsey estate, C. Furinash Sur., 76 bbl. in 6 hr., pumping, est. 175 bbl., pay 4,695-4,701 ft., T.D. 4,708 ft.

Wilson, Cooke County: Burk Royalty Co. 1-B Roy Wilson, W. Moore Sur., 30 bbl. in 24 hr., pumping, 15-qt. shot 2,308-21 ft.

Harvey Drilling Co. 2 Roy Wilson, W. W. Crisp Sur., A-221, 40 bbl. in 24 hr., pumping, pay 2,304-12 ft.

Miscellaneous Fields

Archer County: Colp, Waggoner & Young 1 J. T. Richardson, Sec. 20, J. Scott Sur., A-374, dry at 1,222 ft.

Rathke Oil Co. 5 G. H. Roach, Sec. 1595, T.E.&L. Sur., 17 bbl. in 24 hr., pumping, pay 1,270-80 ft., T.D. 1,282 ft.

Clay County: Staley Oil Co. 7 E. H. Hamilton, Sec. 83, Byers Bros. subd., 55 bbl. in 24 hr., pumping, pay 1,114-24 ft.

Sussex Oil Corp. 27 C. J. Shumake, Sec. 3, Bacon's subd., 25 bbl. in 24 hr., pumping, pay 1,134-44 ft.

Sussex Oil Corp. 28 C. J. Shumake, Sec. 3, Bacon's subd., dry at 1,364 ft.

George G. Golden and T. A. Norwood 1-B K. Enyart, Sec. 7, Thornberry subd., dry at 1,201 ft.

Fisher & Kahn 4 C. T. Taylor, W. Richardson Sur., A-1032, 25 bbl. in 24 hr., pumping, pay 1,130-40 ft.

Akin, Dimock & Costley 5-A J. C. Saner, Sec. 5, Pratt's Past. subd., 15 bbl. in 24 hr., pumping, pay 1,116-23 ft.

Montague County: Rogers & Rogers 7 C. W. Astley, J. Lenow Sur., A-433, 138 bbl. in 3 hr., 1-in. choke, est. 600 bbl., pay 5,265-79 ft., T.D. 5,345 ft.

Wichita County: A. A. Schwartz 4 O. F. Bailey, H. Hastie Sur., A-98, dry at 1,341 ft.

Young County: N. Gray 1 A. L. Porter, W. Cantwell Sur., A-1393, dry at 662 ft.

Pemeta Oil Co. 6 J. A. and W. S. Cole, Sec. 3403, T.E.&L. Sur., 5 bbl. in 24 hr., pumping, 10-qt. shot 689-700 ft., T.D. 702 ft.

Pemeta Oil Co. 4 S. R. Jeffery, Sec. 468, T.E.&L. Sur., dry at 4,975 ft., old well drilled deeper.

S. H. Fagadau 1 Allar Co., Sec. 3410, T.E.&L. Sur., dry at 3,754 ft.

NEW WILDCAT LOCATIONS

Archer County: Sinclair 1 H. C. Soop, SE SE NW Sec. 8, H.&T.C. Sur., A-1218, 6,000-ft. rotary test.

Clay County: H. S. Gray 1 A. Culver, SW SW Sec. 33, Specht McCutchen subd.

Grayson County: Sinclair 1 G. W. Wheeler, 660 ft. from N and W lines of 100-ac. tract in form of square out of SW cor. Charles Quillen Sur., A-989, 5,000-ft. rotary test.

Throckmorton County: Humble 1 S. H. Cain, C NE SE Sec. 1632, T.E.&L. Sur., 4,500-ft. rotary test.

Wichita County: Fresno Oil Co. 1 Fredia Nieman, SE SE Sec. 213, Waggoner Colony subd., 2,150-ft. rotary test.

Young County: Rancho Oil Co. 1 J. M. Nall, C SE SE SW, B.S.&F. Sur., A-40, 4,500-ft. rotary test.

Second Pay Found At Jim Ned Pool

FORT WORTH, Tex. — A second and shallower producing sand for the Jim Ned pool of Coleman County was encountered this week. Gage is being taken on Anderson-Prichard Oil Corp. 1 Matthews, Subdivision 2, H. Kegan Survey 520, a direct south offset to the discovery well, Merry Brothers and Perini 1 Greer, which is producing from the Gray sand (Strawn) at 3,909-37 ft. On last reported gage 1 Matthews had a production estimated at 10 bbl. per hour.

Two locations north, Lewis Production Co. 1 Greer is squeezing off the Gray sand and after plugging back will perforate casing at 3,467-95 ft., where electrical survey had indicated porosity and saturation in the Morris sand. In drilling, 1 Greer cored a show in the upper horizon, but this was cased off and drilling continued to the lower pay zone.

As these two wells neared completion, two new locations were staked in the field. Both will be offsets to the discovery well and both were staked by the Jim Ned Producers, a combination of the acreage holdings of Merry Brothers and Perini and the North-South Oil Co. One of the tests, 1 Babston, will be a west offset to the discovery well, and the other, E. C. G. Bush, will be a north offset.

Discovery Well Gaged

The opening of an oil-producing area in Haskell County became official this week with Ed C. Lawson 1 C. C. Rose, J. M. Cass Survey, taking official Railroad Commission gage. On official gage, 1 Rose pumped 85 bbl. of oil in 6 hours to rate an estimated daily potential of 340 bbl. The well, on acreage farmed out by Amerada, found production in sand at 2,663-95 ft. No. 1 Rose was plugged back from the Palo Pinto lime, which was dry at 3,000 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: Trumter Oil Co. 1 J. R. Taylor, 750 ft. from S and 450 ft. from E lines, Sec. 67, B.O. A. Sur., dry at 408 ft.

Trumter Oil Co. 1-A J. R. Taylor, 150 ft. from N and E lines, Sec. 73, B.O.A. Sur., dry at 403 ft.

Comanche County: J. C. Hamer 2 Mary Smith, Sec. 31, B.B.B.&C. Sur., 40 bbl. in 24 hr., pumping, pay 742-52 ft.

Concho County: Floyd C. Dodson 1 Robert Wilson, Sec. 1, Thomas Green Sur., 4 bbl. oil and 10 bbl. water in 24 hr., pumping, pay 3,753-60 ft., T.D. 4,102 ft., old well drilled deeper.

Jones County: J. C. Hunter 3 W. A. Minter, Lot 9, Robert Smith, Sur. 192, dry at 2,380 ft.

Hendrichson-Milner 1 L. E. Clyburn, Lot 27, Henry Millard Sur. 243, 9 bbl. oil and 9 bbl. water in 24 hr., 5,000 gal. acid 2,292-2,374 ft.

Stephens County: Orion A. Daniel 1 Black estate, Sec. 1283, T.E.&L. Sur., 3,250,000 cu. ft. gas and 67 bbl. oil in 24 hr., ¾-in. choke, 5,000 gal. acid 3,290-3,301 ft., T.D. 4,252 ft.

Fields

Amity, Comanche County: L. H. Choate 5-A Boeicke, Lot 2, Lampasas C.S.L. Sur. 34, 19 bbl. oil and 5 per cent water in 24 hr., pumping, 20-qt. shot 602-32 ft.

Bluff Creek, Shackelford County: Roeser & Pendleton, Inc., and Humble 6 J. P. Morris estate, Sec. 205, E.T. Sur., 15 bbl. in 24 hr., pumping, pay 1,575-80 ft., T.D. 1,588 ft.

Merkel, Taylor County: Fain-McGaha Oil Corp. 2 C. Burford, Lot 5, Grimes C.S.L. Sur. 124, 104 bbl. in 1½ hr., est. 650 bbl., pay 2,581-2,612 ft.

Overall, Coleman County: Anzac Oil Corp. 1 Sealy-Smith, Sec. 13, G.H.&H. Sur., Blk. 1, 9 bbl. in 24 hr., est. 50,000 cu. ft. gas, pay 2,298-2,307 ft., T.D. 2,309 ft., old well drilled deeper.

NEW WILDCAT LOCATIONS

Callahan County: J. D. Kynaston 2 Seale, 750 ft. from S and 5,300 ft. from W lines of J. D. Collins Sur., 1,200-ft. cable-tool test.

Shackelford County: E. C. Lawson 1 J. H. Reeves, SE SE NW Sec. 14, H.&T.C. Sur., Blk. 3, 3,400-ft. rotary test.

ILLINOIS FIELD REPORT

New Operations Are Mostly Exploratory; Production Off

MATTOON, Ill.—Subzero weather of the previous week and a slump in activity which brought little new production skidded the Illinois petroleum yield downward last week. Estimates of Illinois producers placed the daily output closer to 340,000 bbl. daily than the 386,400-bbl. daily limit placed on the state's production by national Petroleum Coordinator Ickes. One producer estimated production as low as 337,300 bbl. daily, more than 10 per cent less than the 381,000 bbl. produced the previous week.

In some producing areas the subzero weather made it necessary to use fires and steam to thaw frozen pipe lines. Routine cleaning of tanks also contributed to the decline.

Operators principally blamed the reduction in exploration for the production decline. Since the issuance of the OPM order governing the spacing of wells, the active operations have dropped from 464 late in December to 339 last week. Many of the 339 operations were not active, having been shut down while the operators awaited clarification of the federal regulations. First reports for the past week totaled 17, a decrease of five from the preceding week and a new low for the past 3 years.

Promising an increase in exploration, however, was the report that 50 drilling permits have been issued by the Oil and Gas Division of the state Department of Mines and Minerals since the ban on issuance of permits was lifted January 7. The permits were for wildcats or wells conforming to the 40-acre spacing regulations in 20 different counties, promising continuance of scattered activity.

To Test Devonian

Magnolia Petroleum Co. has cemented 5½-in. casing to the Devonian lime at a wildcat about 12 miles west and 1 mile south of Mount Vernon, 1 Riddle, NE SE SW 8-3s-1e, after saturation was recovered at 3,752-69 ft. The Devonian was topped at 3,707 ft. Operators recovered some oil and gas on a drill-stem test from 3,774-80 ft.

At present there is no Devonian production in the county. Discovery well of the Dix field, first producing area in Jefferson County, was drilled to that formation in 1937 and showed for a small producer but was eventually plugged back to the Benoist. A test recently drilled to the Devonian in that field was also dry. Other than the Dix field the county's principal producing area is the Woodlawn field, about 3½ miles east of Magnolia's test. Production in the Woodlawn field is limited to the Benoist.

Wildcats Active

Recent oil development in Illinois has been confined mostly to wildcat activity. Benedum-Trees 1 Powell, E½ NW SE 10-3n-10e, one of the more closely watched wildcats in the basin, was reported dry and abandoned last week after being considered a possible pool opener. No. 1 Powell recovered saturation in the McClosky at 3,145-47 ft. but made water on all tests.

Meanwhile, L. & W. Drilling 1 Thompson, N½ NW SE 30-3n-6e has been completed in the Aux Vases sand at 2,760-72 ft. with an initial production of approximately 35 bbl. a day. The well was tested for several weeks in both the Benoist and Aux Vases sands before completion. No. 1 Thompson opens a new pool in Clay County about 5 miles southeast of the recently discovered Clay City West pool.

ILLINOIS COMPLETIONS

Wildcats

Bond County: K. Woolsey 1 File, SW SE SW 22-5n-4w, dry at 593 ft., Pottsville 583 ft.

Crawford County: Page 1 Dennis, W½ NE SE SW 2-6n-13w, dry at 1,760 ft., McClosky 1,494 ft., show oil 1,033-41 ft.

Fayette County: Ryan Oil et al 1-G Torbeck, NW SW SE 20-5n-2e, dry at 2,029 ft., Glen Dean 1,586 ft., Golconda 1,643 ft., Barlow 1,723 ft., Cypress 1,771 ft., Benoist 1,911 ft., Renault 1,974 ft., Aux Vases 2,003 ft.

Jefferson County: Nat. Pet. 1 A. Fitzgerald, SE NE SE 22-4s-3e, dry at 3,034 ft., Menard 2,070 ft., Vienna 2,194 ft., Tar Springs 2,205 ft., Glen Dean 2,293 ft., Hardinsburg 2,366 ft., Golconda 2,412 ft., Barlow 2,564 ft., Cypress sand 2,632 ft., Paint Creek 2,670 ft., Benoist 2,682 ft., Benoist sand 2,274 ft., Renault 2,749 ft., Aux Vases 2,752 ft., Aux Vases sand 2,839 ft., Ste. Genevieve 2,884 ft., Rosiclare 2,909 ft., Fredonia 2,971 ft., St. Louis 3,032 ft.

Macoupin County: W. R. Holms 1 Watkins, SW SE NE 23-8n-9w, dry at 580 ft., sand 420 ft.

Horn & Hunt 1 Boente, SW NW NE 29-10n-7w, dry at 505 ft., no shows.

Madison County: F. C. Kiskadden 1 Fischer, SE SW NW 27-5n-8w, dry at 2,110 ft., St. Louis 505 ft Salem 820 ft., Devonian 1,340 ft., Trenton 1,822 ft., Decorah 1,940 ft.

Richland County: Olson Drlg. 1 Boyd, W½ SW SW 1-3n-10e, dry at 3,326 ft., Menard 2,382 ft., Glen Dean 2,592 ft., Golconda 2,679 ft., Barlow 2,751 ft., Ste. Genevieve 3,119 ft., McClosky 3,263 ft.

Benedum-Trees 1 L. J. Powell, E½ NW SE 10-3n-10e, dry at 3,182 ft., Ste. Genevieve 3,087 ft., tested salt water.

Saline County: Wiser 1 Neal, N½ NW NE 9-8s-7e, dry at 3,109 ft., Kincaid 1,670 ft., Palestine sand 1,985 ft., Menard 2,085 ft., Waltersburg 2,139 ft., Vienna 2,192 ft., Tar Springs sand 2,267 ft., Glen Dean 2,286 ft., Golconda 2,424 ft., Barlow 2,573 ft., Aux Vases sand 2,924 ft., Ste. Genevieve 2,944 ft., Rosiclare 2,962 ft., Fredonia 3,016 ft., McClosky 3,042 ft.

Seaboard 1 S. H. Galbraith, W½ NW SW 28-7s-5e, dry at 3,420 ft., Kincaid 1,886 ft., Palestine 2,234 ft., Menard 2,274 ft., Vienna 2,418 ft., Tar Springs 2,460 ft., Glen Dean 2,565 ft., Hardinsburg sand 2,609 ft., Golconda 2,672 ft., Barlow 2,814 ft., Cypress 2,865 ft., Paint Creek 2,956 ft., Benoist 2,998 ft., Renault 3,053 ft., Ste. Genevieve 3,177 ft., St. Louis 3,343 ft.

Wayne County: R. Powers et al 1 Musgrave, N½ NW SE 19-2s-6e, dry at 3,329 ft., Glen Dean 2,618 ft., Barlow 2,825 ft., Cypress sand 2,868 ft., Paint Creek 2,990 ft., Benoist 3,074 ft., Renault 3,095 ft., Aux Vases sand 3,121 ft., Ste. Genevieve 3,187 ft., Fredonia 3,255 ft., McClosky 3,304 ft.

White County: Cameron Oil 1 H. Reiling, SW SE SE 21-6s-10e, dry at 3,201 ft., West Franklin 400 ft., Kincaid 1,848 ft., Menard 2,150 ft., Tar Springs 2,365 ft., Glen Dean 2,418 ft.

A. A. Cameron 1 DeBoard heirs, SE NE NE 2-7s-8e, pumped 60 bbl., Aux Vases sand 2,958-85 ft., T.D. 2,989 ft., P.B. 2,882 ft.

Fields

Benton, Franklin County: Paul Mosebach 1 Sanders, SE SW SE 23-6s-2e, dry, old well deepened from 2,125-2,977 ft., Glen Dean 2,207 ft., Hardinsburg 2,258 ft., Golconda 2,318 ft., Barlow 2,460 ft., Cypress sand 2,505 ft., Paint Creek sand 2,645 ft., Benoist 2,720 ft., Aux Vases sand 2,739 ft., Ste. Genevieve 2,797 ft., Rosiclare 2,825 ft., Fredonia 2,888 ft., junked hole, elev. 421 ft.

Dale, Hamilton County: Texas 13 R. R. Johnson, SW NW NW 18-6s-7e, flowed 240 bbl., Aux Vases 3,059-78 ft., T.D. 3,078 ft.

Ohio 2 C. W. Hall, SW NW SW 8-6s-7e, flowed 597 bbl., Aux Vases 3,005 ft., T.D. 3,031 ft.

McBride 2 Pennington Comm., NW SE SE 12-6s-6e, swabbed and flowed 675 bbl., Aux Vases 3,042-82 ft., T.D. 3,082 ft.

Carter 2 C. Johnson, NE SW SE 12-6s-6e, pumped and flowed 413 bbl., Aux Vases sand 2,067-85 ft., T.D. 3,092 ft.

Dix, Jefferson County: Carter 3 R. Dobbs, SE SW NE 10-1s-2e, pumped 50 bbl., Benoist 1,959 ft., T.D. 1,963 ft.

Dubois, Washington County: Winn & Redwine 1 A. B. Rudolph, SW SE SW 17-3s-1w, pumped 19 bbl. oil and 6 bbl. water, Benoist 1,374 ft., T.D. 1,382 ft.

Dupo, St. Clair County: H. H. Webster 2 Eckert, N½ NE SE SW 34-1n-10w, pumped 20 bbl. oil and 100 bbl. water, Trenton 720 ft., T.D. 748 ft.

W. Braum 2 Metter, NW SW SE 34-1n-10w, pumped 15 bbl. oil and 105 bbl. water, Trenton 695 ft., pay 705 ft., T.D. 725 ft.

East Centerville, White County: McBride 1 fee, NW NE SE 7-4s-10e, pumped 106 bbl., McClosky 3,214-20 ft., T.D. 3,220 ft.

Epworth, White County: Nat. Pet. 3 McQueen, NW NE SW 32-5s-10e, pumped 88 bbl., Clore sand 2,088-2,101 ft., T.D. 2,105 ft.

Grayville West, White County: Wall 1-B Kershaw, N½ NE SW 22-3s-10e, dry at 3,220 ft., Glen Dean 2,598 ft., Ste. Genevieve 3,152 ft., McClosky 3,204 ft.

Griffin, Wabash County: Longhorn 26 Helm, NW SW NE 27-3s-14w, pumped 148 bbl., Cypress sand 2,507-15 ft., 2,561-75 ft., T.D. 2,577 ft.

Irons, White County: Pure and Carter 1 M. W. Martin, NW SE NE 18-6s-9e, pumped and flowed 301 bbl., Paint Creek sand 2,745-95 ft., T.D. 2,795 ft.

Keensburg, Wabash County: Continental 10-A A. E. Schultz, SE SW SE 8-2s-13w, pumped 52 bbl. oil and 9 bbl. water, Cypress sand 2,420-34 ft., Benoist 2,537-56 ft., 2,564-83 ft., T.D. 2,589 ft.

Continental 2-A A. E. Schultz, SE NE SE SE 8-2s-13w, pumped 102 bbl., Benoist 2,556-66 ft., 2,571-90 ft., old well deepened from 2,439-2,590 ft.

Mill Shoals, White County: McBride 1 B. Gray, NE SE SW 30-3s-8e, pumped 165 bbl., McClosky 3,279-85 ft., T.D. 3,290 ft.

New Harmony, White County: Bay Pet. 1 O. R. Evans, NW NW SW 4-4s-14w, pumped 75 bbl., Aux Vases 2,790-2,814 ft., T.D. 2,814 ft.

Mabee Drlg. 2 F. M. Hon, NE NW NE 9-4s-14w, pumped 65 bbl., Aux Vases 2,833-42 ft., T.D. 2,850 ft.

North Benton, Franklin County: Torbett 1 R. Stuart, SE NE NE 11-6s-2e, pumped 76 bbl., Ste. Genevieve 2,727 ft., T.D. 2,876 ft., P.B. 2,772 ft.

Johnsonville, Wayne County: United Prod. 2 Ina Matchett, pumped 175 bbl., Aux Vases 2,949 ft., T.D. 2,964 ft.

Texas 3 S. Sweeney, E½ NE SE 34-1n-6e, pumped 235 bbl., Aux Vases 2,980 ft., T.D. 3,005 ft.

United Prod. 4 A. A. Watson, E½ SW NE 34-1n-6e, pumped 300 bbl., Aux Vases 2,978 ft., T.D. 2,993 ft.

Wiser Oil 7 A. A. Watson, E½ NE NE 34-1n-6e, dry at 3,001 ft., Aux Vases 2,985 ft.

Wiser Oil 1-C Dickey, S½ NW NW NE 3-1s-6e, pumped 250 bbl., McClosky 3,164-76 ft., T.D. 3,246 ft.

Ohio Fuel Supply 2 W. W. Hill, S½ NE SW NE 4-1s-6e, swabbed and flowed 400 bbl., McClosky 3,197-3,204 ft., T.D. 3,226 ft.

Jablonski 1 Evans, N½ NE SW 23-1n-6e, dry at 3,252 ft., McClosky 3,195-3,204 ft., old well worked over.

Rising Sun, White County: Magnolia 11 Sisson-Higgins, NE NE SE 24-6s-10e, pumped 60 bbl., Tar Springs sand 2,242 ft., T.D. 2,262 ft.

Roland, White County: Clum 2 Ledbetter, S½ NE NE NE 14-7s-8e, pumped 10 bbl., Aux Vases 2,881-89 ft., T.D. 2,904 ft.

Rural Hill, Hamilton County: Texas 7 M. Lockwood, NW SE SW 13-6s-5e, pumped 412 bbl., Aux Vases sand 3,196-3,216 ft., Levias 3,252-76 ft., McClosky 3,352-66 ft., 3,388-3,406 ft., T.D. 3,428 ft.

Magnolia 1 J. A. Hamilton, NW NE SW 24-6s-5e, flowed 263 bbl., Aux Vases sand 3,108 ft.

Texas 9 M. Lockwood, NE NW NE 24-6s-5e, flowed 1,055 bbl. in 10 hr., Aux Vases sand 3,120-40 ft., Levias 3,176-3,204 ft., McClosky 3,264-94 ft., T.D. 3,330 ft.

Texas 10 M. Lockwood, NW NW NE 14-6s-5e, flowed 540 bbl. in 13 hr., Aux Vases sand 3,122-50 ft., Levias 3,187-3,204 ft., McClosky 3,267-84 ft., 3,292-3,304 ft., T.D. 3,343 ft.

St. Paul, Fayette County: H. Luttrell 1-C Aukamp, SW NW SE 30-5n-3e, pumped 100 bbl. oil and 33 bbl. water from Benoist, T.D. 1,913 ft.

Simms, Wayne County: Fotiades 1 L. Withrall, S½ NE NW 28-1s-6e, pumped 250 bbl., Aux Vases 3,036-49 ft., T.D. 3,229 ft., P.B. 3,100 ft.

Texas 1 B. Talbert, W½ SE SW 28-1s-6e, pumped 218 bbl., Aux Vases sand 3,010-34 ft., McClosky 3,149-53 ft., 3,160-63 ft., T.D. 3,171 ft.

Texas 3 B. Talbert, E½ SE SE 28-1s-6e, pumped 134 bbl., Aux Vases 3,003-19 ft., McClosky 3,137-44 ft., 3,169-72 ft., T.D. 3,182 ft.

Woodlawn, Jefferson County: Baldwin et al 1 Oslager, SW SE SE 26-2s-1e, dry at 2,041 ft., Benoist 2,000 ft.

Magnolia 11 I. Shirley, SW NE SE 35-2s-1e, salt-water-disposal well, Pottsville 872 ft., T.D. 1,185 ft.

California Fields

(Continued from Page 56)

Piru, Ventura County: Glen Ogle Oil Co. 1 Lisk, 21-5n-18w, abandoned as unproductive, T.D. 1,791 ft., no showings of importance logged.

Santa Maria Valley, Santa Barbara County: Southwest Dev. Co. 1 Mendoza, 13-10n-34w, abandoned account off structure, T.D. 1,683 ft., location disproved by abandonment of nearby outpost.

Union 3-3 Moretti, 14-10n-35w, pumped 1,248 bbl., 14.5-gravity, 1.4 per cent cut, T.D. 5,447 ft., perf. 5,196-5,446 ft., completed in Monterey of Miocene age.

Shiells Canyon, Ventura County: Havlin & Pottenger 1 Shiells, 33-4n-18w, abandoned as dry hole, T.D. 4,634 ft., no oil showings found.

Ventura Avenue, Ventura County: British American Oil Prod. Co. 8 Hartman, 21-3n-23w, flowed 890 bbl., 26.3-gravity, 10 per cent cut, 533,000 cu. ft. gas, two 64/64-in. beans, pressures 100/525 lb., T.D. 9,680 ft., perf. 7,725-7,890 ft., 7,919-8,600 ft., 8,800-9,680 ft., redrilled and deepened from 8,772 ft. and returned to production in lower Lloyd zone of Pliocene age.

Shell 46 Taylor, 28-3n-23w, flowed 1,243 bbl., 30.7-gravity, 0.4 per cent cut, 1,949,000 cu. ft. gas, 128/64-in. bean, pressures 190/750 lb., T.D. 8,200 ft., perf. 7,431-7,834 ft., 7,859-8,196 ft., redrilled and deepened from 7,136 ft., and returned to production in 57 zone of Pliocene age.

LOUISIANA GULF COAST

Salt Dome Flank Exploration Revives Old Starks Field

By F. L. SINGLETON

NEW ORLEANS, La. — Development in the Starks field, Calcasieu Parish, was being revived with the opening of prolific production on the northwest flank of the dome by W. T. Burton 4 Lutcher Moore, which flowed at the rate of 218 bbl. per day on a 10/64-in. choke from sand at 6,010-15 ft. Tubing pressure was 840 lb., and casing pressure 750 lb. This dome was found in 1925 and first production was opened in 1927. It has produced several million barrels of oil from the cap rock, Miocene and Oligocene sands at intervals from 1,500 to 4,800 ft. and at a recent date there were 22 producing wells, the majority of which are pumping a daily average of only 376 bbl. The new discovery is located in the northwest corner of 18-9s-12w.

In line with this type of development, Union Oil Co. of California is moving in material to the north flank of the Vinton field, Calcasieu Parish, for 1 Gray estate in 32-10s-12w. Further development around the flanks of this structure was recently encouraged by new production found on the south flank in the Oligocene sand at 3,200 ft. by the Union Sulphur Co.

Exploration at the Avery Island salt dome was being resumed as Humble Oil & Refining Co. prepared to drill 1 Petit Anse Co. in 25-13s-5e. The acreage was obtained from the Gulf Refining Co. which drilled a 12,000 ft. test on the acreage the past year. The new location is 1,500 ft. northeast of the dry hole.

On the Thornwell prospect, Jefferson Davis Parish, Cities Service Oil Co. was running tubing in 1 Lacassine Co., preparatory to making a production test through perforated casing at 10,319-21 ft. Geological markers released during the week are as follows: Potamides Matsoni 4,985 ft., small Discorbis 8,588 ft., large Discorbis 9,486 ft., and the first Heterostegina at 10,290 ft. The well is located in 36-11s-5w, and all indications point to a gas-distillate producer.

Vendome Petroleum Co. 4 Kenilworth, an outpost north of the discovery well, is coring in shale below 10,635 ft., and sand showing oil is reported to have been cored at 10,608-28 ft. This is the same sand as found in the discovery well. This field was opened in 1938 and development thus far has been disappointing.

Humble Oil & Refining Co. has resumed development at the Bayou Des Glaise dome, Iberville Parish where preparations are being made to drill 1 Alamo Land Co., on the north flank in 85-8s-8e. The location is about 3,500 ft. northwest of 1-B Schwing, a dry hole. Of the three wells drilled by the company around the flanks of the structure all have logged encouraging showings, but no commercial production was ever developed.

Gulf 1 Eschete, an outpost well northeast of the discovery well of the Lapeyrouse field, Terrebonne Parish was abandoned at a total depth of 12,004 ft. after an electrical survey failed to record any shows of oil or gas. The discovery well was drilled to a total depth of 12,149 ft., and was completed as a gas-distillate producer at 10,883-87 ft. In the South Houma area, Pan American Production Co. obtained a farmout from Shell Oil Co. for a semi-wildcat, 1 La Terre Co., Inc., in 67-18s-18e.

Additional producers were being added to the Bayou Sale field, St. Mary Parish. The wells are Atlantic 2 St. Mary Land Co. bottomed at 11,348 ft., and Humble 2 Marin, bottomed at 10,250 ft. Both wells are in the south end of the field, and sufficient sand in the regular field pay has been logged to assure commercial production. This was the district's most outstanding discovery the past year and it is thought that production will eventually be tied in with that of the Bateman Lake field, about 2 miles to the south.

LOUISIANA GULF COAST COMPLETIONS

Fields

Anse La Butte, St. Martin Parish: Stanolind 8 Bergeron, 154 bbl., 9/64-in. choke, perf. casing 3,610-50 ft., T.D. 3,969 ft.

Stanolind 1-A Emilie, 182 bbl., 9/64-in. choke, T.D. 6,150 ft., P.B. T.D. 6,000 ft.

Bayou Blue, Iberville Parish: Superior 20 Schwing Lumber & Shingle Co., 125 bbl., ⅛-in. choke, perf. casing 3,778-83 ft., T.D. 4,017 ft.

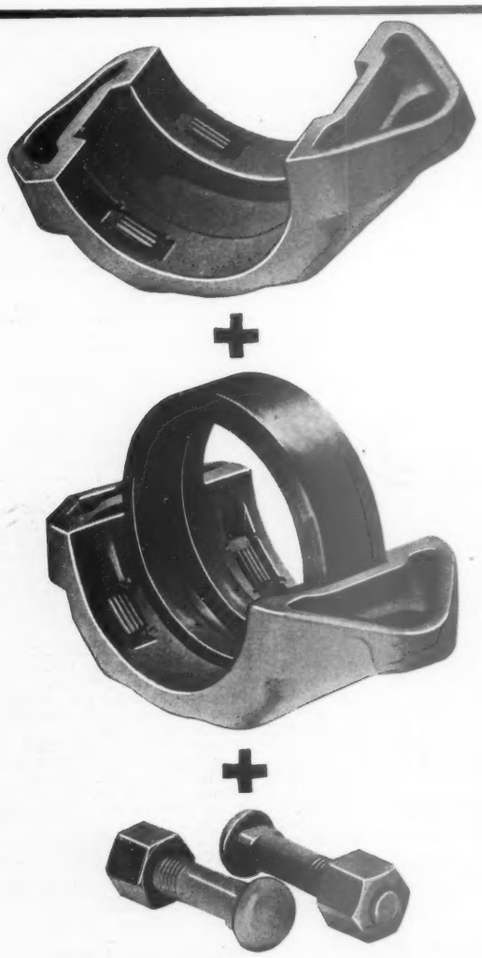
Bosco, Acadia Parish: Superior 5 Hernandez, 30 bbl., 8/64-in. choke, T.D. 8,901 ft., P.B. T.D. 8,800 ft.

Delta Farms, Jefferson Parish: Texas 3 State Bayou Perot, dry, T.D. 12,015 ft.

East Hackberry, Cameron Parish: Harrison & Abercrombie 4 Vidrine, 180 bbl., 8/64-in. choke, T.D. 7,386 ft., P.B. T.D. 7,370 ft.

Garden Island, Plaquemines Parish: Texas 55 State, 81

(Continued on Page 64)



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TEXAS GULF COAST

New Field Showing on Brush Creek-Provident City Trend

By NEIL WILLIAMS

HOUSTON, Tex.—The Texas Gulf Coast sector of the Wilcox trend had promise of another new field as casing was being cemented in John Mayo et al 1 Rother, located 12 miles southeast of Hallettsville, Lavaca County. Five and one-half inch casing was being cemented on bottom at 9,104 ft., preparatory to testing several sands which showed up favorably on an electrical survey. Side-wall cores at 8,995-97 ft. recovered sand with an oil odor while sand with a gas-distillate taste was logged at 9,003-07 ft.

Top of the Wilcox was logged at approximately 7,300 ft., and the well is reported to have checked structurally high. The well is on strike with the Provident City and Brush Creek fields, both of which were opened the past year as gas-distillate structures. This particular area of the trend has experienced a broad leasing and geophysical program during the past year and is due to receive considerable wildcatting during the year.

Wildcats in the Pay

American Republic and Houston Oil Co. 1 Cushing fee, a wildcat in southeastern Tyler County, 1½ miles southwest of Joe's Lake, was shut in after flowing 13 bbl. of pipe-line oil per hour through a $\frac{3}{16}$-in. choke from the Wilcox sand at 8,000-10 ft. Locations for three offsets have been made . . . J. G. Mayo 1 A. C. Rodesney, discovery well midway between the Ganado and Mauritz fields, Jackson County, flowed 115 bbl. of 28.8-gravity oil on a 24-hr. potential test through a ⅛-in. choke. In the Needville field, Fort Bend County, W. L. Goldston 1 A. Smith, 1,200 ft. south of the discovery well, tested 15 lb. working pressure and recovered 150 ft. of oil and sand on a 2-minute drill-stem test at 5,183-90 ft. . . . In the same county, in the Rosenberg area, H. L. Hunt 1 Moore estate, H. Scott Survey, flowed an estimated 3,000,000 cu. ft. of gas and an estimated amount of water-white distillate through a $\frac{3}{16}$-in. choke on the drill stem stuck at 8,734 ft. . . . C. P. Culmore et al 1 G. T. Lundy, John Forbes Survey, the discovery well of a shallow Wilcox field in Houston County pumped 146 bbl. of fluid, mostly oil, in 18 hr. from pay sand at 3,215-20 ft. . . . Continental 1 C. T. Doman, Matagorda County, was in the Frio below 8,396 ft. and will soon test. . . . Rowan & Nichols 1 W. H. Land, a wildcat south of Anahuac field, Chambers County, was retested in a new sand section in the Frio at 9,040-42 ft. and flowed an estimated 1,000,000 cu. ft. of sweet gas daily with a slight spray of distillate. These perforations were squeezed off and another test was to be made around 8,700 ft.

IMPORTANT LOCATIONS

Chambers County: Stanolind 1 J. C. Englin, south offset to discovery well, Stowell field R. H. Parker Sur.

Jackson County: Gulf 1 M. K. Simon, F. F. Wells Sur., semiwildcat, Texana field.

S. W. Richardson 1 W. L. Fenner, R. Musquez Sur., semiwildcat, Texana field; located on farmout from Shell Oil Co., Inc.

Tyler County: Stanolind 2 J. F. Parker, 1,555 ft. E of discovery well of Fred field, George T. W. Collins Sur.

Wharton County: Clark & Cowden 1 Kountze, wildcat located in Danevang area, southern part of county, in E.R.R.R. Sur., Sec. 85.

Salt Dome in Brazos

Operators interested in the updip sector of the trend centered their attention of the Millican prospect, Brazos County, which was proven as a salt-dome structure the past week by Phillips 1 M. E. Mitchell, located in the J. M. Barrera. Salt formation was reported topped at 5,001 ft., and was drilled to a depth of 5,511 ft., where the well was abandoned. Location has been made by the company for 1 G. W. Schoepps, approximately 2 miles southeast. The dome is situated approximately 30 miles northeast of the Clay Creek salt structure in Washington County.

TEXAS GULF COAST COMPLETIONS

Wildcats

Harris County: Texas 1 Harris Co. Land & Improvement Co., dry, T.D. 4,512 ft.

Walker County: Cox & Ferrell 1 Foster estate, dry, T.D. 6,723 ft.

Fields

Anahuac, Chambers County: Humble 40 Johnson, 662 bbl., ¼-in. choke, top sand 6,969 ft., T.D. 7,140 ft.

Conroe, Montgomery County: J. N. Rayzor 1 Brent, dry, T.D. 5,080 ft.

Danbury, Brazoria County: Rowan Drilling Co. 16 Jameson, dry, T.D. 4,000 ft.

Dyersdale, Harris County: Jack Frazier 1 D. H. Smith, 146 bbl., ¼-in. choke, perf. casing 4,062-75 ft., T.D. 4,083 ft.

Ganado, Jackson County: Texas 4 Hultiquist, 168 bbl., ⅛-in. choke, perf. casing 6,631-34 ft., T.D. 7,004 ft.

(Continued on Page 70)

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EASTERN TEXAS FIELDS

Arkansas Discovery Leads to Search for Smackover Pay

By D. H. STORMONT

DALLAS, Tex.—Ever since the discovery of Smackover lime production in the southwestern part of Arkansas, operators in the northern counties of the East Texas district have considered it possible that this production may extend westward into Texas. On the basis of this possibility, operators have engaged in spasmodic flurries of activity, leasing and blocking, although very few tests have ever been carried to the Smackover here.

Such a play was again under way last week in the northern part of the district, extending from Bowie County westward into Hunt County as a result of Barnsdall Oil Co's. recent discovery in Lafayette County, Arkansas, which rated an open-flow potential of between 15,000 and 25,000 bbl.

Probably the greatest concentration of Smackover lime activity is in Hunt County, where several thousand acres of land have been placed under lease between Greenville and Commerce. Two major companies, Magnolia and Humble, are reported taking large blocks in this area. It is also reported that an attempt is being made to work out a deal to take Parson Bros. 1 Marshall, D. Rusmus Survey, to the Smackover lime. No. 1 Marshall, on the northeast edge of the town of Commerce, was a Paluxy sand failure at 5,010 ft.

Several isolated attempts have so far been unsuccessful. The possibility of the existence of the lime still remains and future exploration toward this objective can be expected in the district.

Houston County Discovery

The Wilcox sand discovery, C. P. Culmore and Ed Gillespie 1 Lundy, Forbes Survey, 1 mile southeast of Lovelady in Houston County, early this week reported final completion gage. No. 1 Lundy pumped 156 bbl. of 27.5-gravity oil in 24 hours on initial gage after a shut-in period to erect pump. No water was reported. Pay was through casing perforation from 3,215-20 ft. in the Wilcox sand, topped at 2,084 ft. The discovery had been plugged back from 5.016 ft. and 5½-in. casing set at 3,295 ft.

On later gages, however, I Lundy developed water. An 18-hour gage gave the well 146 bbl. of fluid, 90 per cent 26.4-gravity oil and the rest water. As testing continued more water appeared, so operators ordered perforations squeezed off, planning to reperforate at another depth. Previous squeeze jobs were made at 3,206-07 ft. and 3,226-29 ft. in a move to insure a shutoff.

EAST TEXAS COMPLETIONS

Wildcat

Robertson County: J. Doran 1 W. C. Anderson, J. Webb Sur., 6 mi. NW of Calvert, dry at 1,439 ft.

East Texas Field

(1-hour gage)

Joiner, Rusk County: C. H. Lyons 5-A S. H. Moores, M. V. Pena Sur., 40 bbl., top Austin 3,417 ft., pay 3,569-95 ft.

Longview, Gregg County: Roosth & Genecov 2 Smith, J. Price Sur., 56 bbl., pay 3,819-40 ft.

Other Fields

Flag Lake, Navarro County: Topaz Oil Co. 6 W. T.

(Continued on Page 68)

Louisiana Gulf Coast

(Continued from Page 62)

bbl., 5/32-in. choke, T.D. 8,188 ft., P.B. T.D. 5,560 ft.

Horseshoe Bayou, St. Mary Parish: Texas 5 St. Mary Parish Land Co., 296 bbl., 10/64-in. choke, sand 10,882-10,906 ft.

Iowa, Jefferson Davis Parish: S. W. Richardson 1 Tuten, 73 bbl., ⅛-in. choke, perf. casing 7,417-21 ft.

North Crowley, Acadia Parish: Humble 3 Thevis, 744 bbl., ¼-in. choke, perf. casing 8,605-08 ft., T.D. 8,800 ft.

Port Allen, West Baton Rouge Parish: Amerada 5 Wilberts, 228 bbl., 5/32-in. choke, perf. casing 9,600-04 ft., T.D. 9,778 ft.

Quarantine Bay, Plaquemines Parish: Gulf 5-A Orleans Levee Board, 229 bbl., ⅛-in. choke, perf. casing 8,151-78 ft., T.D. 8,594 ft., old well.

Roanoke: Humble 9-B Devilbiss, old well, 166 bbl fluid, 97 per cent oil and 3 per cent salt water, perf. casing 8,812-16 ft., T.D. 8,861 ft.

Venice, Plaquemines Parish: Tide Water 13 Buras Levee District, 210 bbl., ⅛-in. choke, perf. casing 10,093-10,110 ft., T.D. 10,193 ft.

Ville Platte, Evangeline Parish: Continental 3 Fontenot, 217 bbl., 16/64-in. choke, perf. casing 10,222-36 ft., T.D. 10,271 ft.

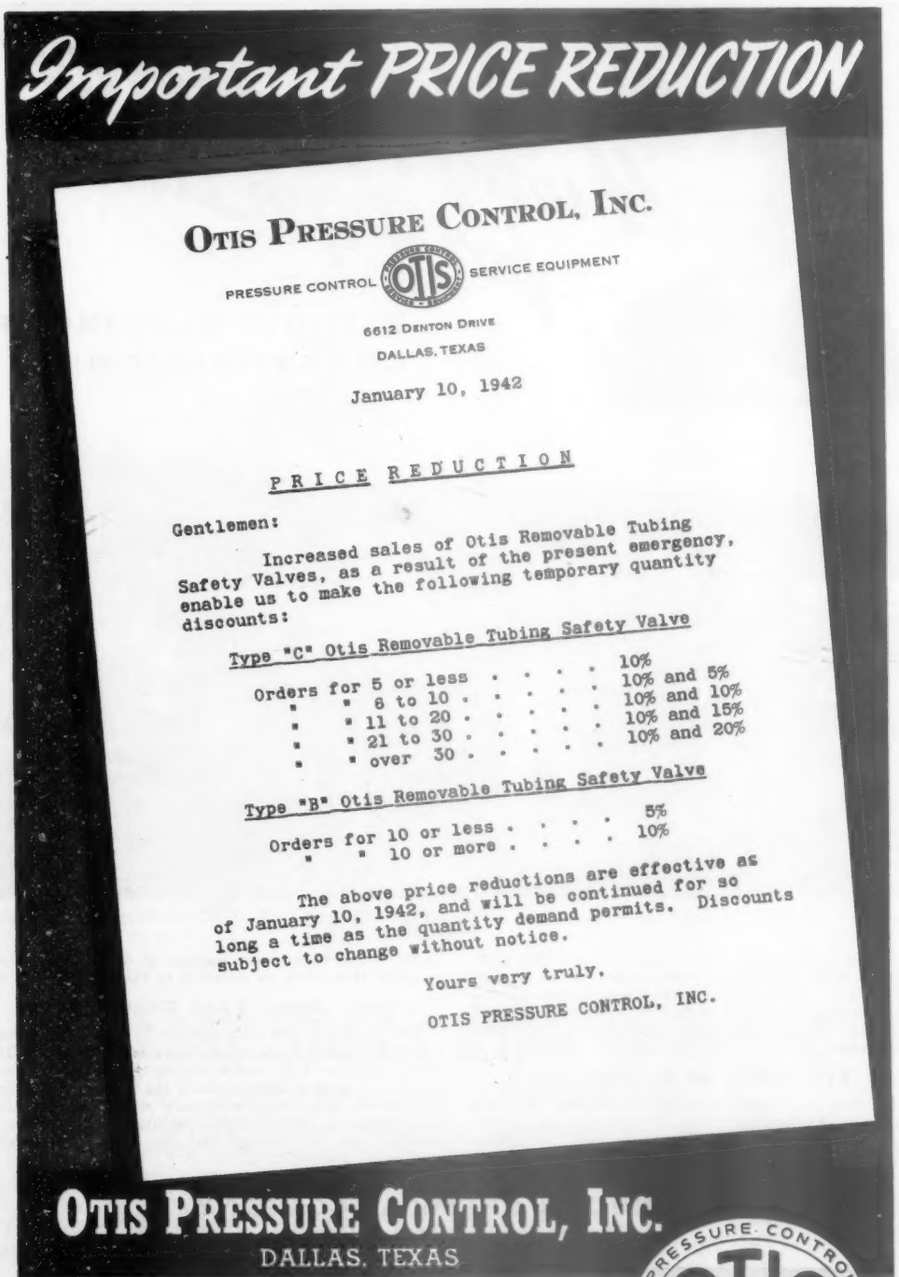
Continental 1 Adams Tate, 232 bbl., 12/64-in. choke, perf. casing 10,154-68 ft., T.D. 10,190 ft.

Continental 5 J. E. Vidrine, dry, T.D. 10,310 ft.

Vinton, Calcasieu Parish: Union Sulphur 3 Gray, 62 bbl., 10/64-in. choke, perf. casing 3,497-3,513 ft., T.D. 4,511 ft.

West Bay, Plaquemines Parish: Gulf 4-B Timolat, old well, 251 bbl., 5/32-in. choke, perf. casing 7,282-89 ft., T.D. 7,400 ft.

West Hackberry, Cameron Parish: Stanolind 61 Kelso, 474 bbl., ⅛-in. choke, T.D. 9,855 ft., P.B. T.D. 9,485 ft.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PRESSURE CONTROL OTIS SERVICE EQUIPMENT

Peace Creek Extended South And Northeast by Good Wells

By ROBERT INGRAM

ONE of the most lively drilling areas in the state last week was at Peace Creek, in Reno County, a recent discovery which already has 18 producing wells and is surrounded by producing outposts which indicate a wide producing area. Most of the wells have been given the maximum potential (5,000 bbl.).

Most recent extension was John W. Simpson and Simpson Oil Co. 1 Hollenbeck, NE SW NW 28-23-10w, ½ mile south of production, which filled to the top of the casing with oil after cement plug was drilled. Later the well was reported flowing 420 bbl. in 8 hours natural. Production, as in the rest of the pool was from the Viola lime. Pay was topped at 3,791 ft. and drilled to 3,801 ft.

Among other active wells was Leader Oil Co. 1 McMurry, NE SE SE 10-23-10, northeast of production, which had the Viola at 3,769 ft., set 5½-in. casing at 3,769 ft., had first gas at 3,773 ft., oil at 3,774-77 ft., total depth 3,782 ft., was treated with 1,000 gal. of acid and on the fourth swab began flowing and made 146 bbl. in 3 hours. It was closed in for 6 hours, and then flowed 32 bbl. in 30 minutes.

Leader Oil Co. 2 Tonn, NE SW SW 11-23-10, 1½ miles northeast of Peace Creek proper and offset to the 1 Tonn, swabbed 33 bbl. an hour natural and 66 bbl. after acid, from Viola lime at 3,758 ft. Cities Service 1 Haylmun, NE NE 15-23-10, had the Viola at 3,762-68 ft. and was flowing after acid treatment. Magnolia Petroleum Co. 3 Yust, SW NE SW 15-23-10, had the Viola at 3,758 ft. and was ready to drill in with 5½-in. set at 3,769 ft.

Extent of the Peace Creek area, plus the fact that its development had just started, made it increasingly favorable for drilling under the 40-acre spacing requirements.

Discovery Near Abbyville

While the Peace Creek development spread, eastern Reno County gained its second discovery of the year. It was Cities Service 1 Morton, SW NE 17-24-8w, which was swabbing 8 bbl. an hour from the Lansing-Kansas City lime series topped at 3,180 ft. The new pool is 4 miles due west of the Abbyville pool, also a Lansing area.

Originally the 1 Morton was drilled to a total depth of 3,910 ft. in Arbuckle dolomite. Then it was plugged back and perforated from 3,500-11 ft. and from 3,402-50 ft. and then treated with 3,000 gal. of acid.

Waite Phillips Drills Well at Zyba

Waite Phillips, Tulsa, got back into the oil producing business last week when he brought in, with Leader Oil Co., 1 Mary Sprout, NE NE 13-30-1w, the second producer in the Zyba pool of Sumner County. The well made 20 bbl. of 49.5-gravity oil in 20 minutes and was given a daily potential of 400 bbl. from Misener sand 3,847-50 ft., higher than the discovery well. It was drilled to a total depth of 3,858 ft.

Barber County Discovery

Champlin Refining Co. 1 C. W. Hildebrand, E½ NE NW 26-32-15w, topped the Lansing-Kansas City lime series at 4,160 ft. and cut two cores in the base of the Lansing-Kansas City with good saturation in the upper core and light saturation in the second core. Coring ahead, the Mississippian lime was topped at 4,740 ft. by samples and one core cut in this formation showed light saturation.

KANSAS COMPLETIONS

Wildcats

Barton County: J. J. Lynn 1 Kraft, S½ SE NW 36-16-11w, pumped 148 bbl. in 8 hr., potential 544 bbl., gravity 42, Arbuckle 3,357 ft., T.D. 3,370 ft., *discovery.*

Sinclair Prairie 1 Kowalsky, N½ NE SW 32-20-11w, pumped 51 bbl. oil and 24 bbl. water in 8 hr., potential 154 bbl. oil and 72 bbl. water, 49.8 gravity, Arbuckle 3,377 ft., T.D. 3,408 ft., acid, *discovery of Kowalsky pool.*

Jefferson County: E. V. Jackson 1 Sheldon, NE SE 14-9-19e, dry, Bartlesville 1,645 ft., Mississippi 1,699 ft., T.D. 1,749 ft.

E. V. Jackson and Joe Bradley 1 Northwestern Mutual, E½ SE NE 24-9-19e, dry, Mississippi 1,595 ft., T.D. 1,734 ft.

Workman & Sherrod 1 Riling, SW SW SE 22-10-19e, dry, Bartlesville 1,551-60 ft., Mississippi 1,58[illegible] ft., T.D. 1,604 ft.

Rice County: Luther Mackall 1 Willard estate, W½ NW NE 33-20-10w, dry, Lansing 2,983 ft., Simpson 3,288 ft., Arbuckle 3,327 ft., T.D. 3,345 ft.

Stafford County: Iron Drilling 1 Findlay, W½ NW SE 6-24-12w, dry, anhydrite 719 ft., Viola 3,828 ft., Simpson 3,940 ft., T.D. 3,951 ft.

Sumner County: E. B. Shawver 1 Kemp, SE SE SE 8-35-2e, flowed 30 bbl., Mississippi 3,360 ft., pay 3,388-3,402 ft., T.D. 3,697 ft., P.B. to 3,405 ft., *discovery.*

Fields

Ainsworth, Barton County: Stanolind 5 Kultgen, N½ NE NE 26-16-13w, pumped 82 bbl. oil, 19 per cent water, Arbuckle 3,409-24 ft.

Bedford, Stafford County: Cities Service 4 Knoche, SE NW SE 28-23-12w, dry, Arbuckle 3,860 ft., T.D. 3,867 ft.

Bemis, Ellis County: Cities Service 8 Colahan-C, E½ SE SE 24-11-17w, potential 3,000 bbl., pumping, Arbuckle 3,340-53 ft.

Deep Rock 36 Baumer, W½ SW SE 27-11-17w, potential 2.540 bbl., pumping, Arbuckle 3,576-93 ft.

Bloomer, Ellsworth County: Helmerich & Payne and Phillips 1 Secrest, E½ NE SE 20-17-10w, dry, T.D. 3,384 ft.

Skelly 10 Moran, N½ N½ SE 31-17-10w, dry, T.D. 723 ft.

Chindberg, McPherson County: George Hess 1-A Ek, SW SW NE 24-19-3w, dry, Kansas City 2,343 ft., T.D. 2,375 ft.

Dayton, Phillips County: Carter 1 R. L. Dusin, NE SE 35-2-19w, potential 1,673 bbl., pumping, Lansing 3,148-3,338 ft., T.D. 3,344 ft.

Eldorado, Butler County: Allbe Oil & Gas 57 Porter, NE SE NW 6-26-5e, pumped 40 bbl., Kansas City lime 2,013-26 ft.

Forest Hills, Russell County: El Dorado Refining 1 Steinle, W½ NE NE 29-15-12w, potential 410 bbl., pumping, Arbuckle 3,318½-27½ ft.

Central and Pryor & Lockhart 1 Luerman, N½ NW SW 29-15-12w, dry, Arbuckle 3,355 ft., T.D. 3,378 ft.

Geneseo, Rice County: Continental et al 8 Ainsworth, NE SE SE 24-18-8w, potential 3,000 bbl., pumping. Arbuckle 3,110-84 ft.

Greenvale, Russell County: Cities Service 3 Major-B, W½ NE SE 5-15-12w, pumped 139 bbl., Gorham sand 3,240-49 ft.

Kraft-Prusa, Barton County: Carter 3 Burmeister, E½ SW NW 2-17-11w, pumped 423 bbl. oil, Arbuckle 3,330-46 ft.

Shell 5 Burmeister, W½ NE SE 3-17-11w, potential 3,000 bbl., pumping, Arbuckle 3,303-14 ft.

Aylward 3 North Wendtlandt, NW NW NE 4-17-11w, dry, Arbuckle 3,346 ft., T.D. 3,357 ft.

Lamont, Greenwood County: Aikman et al 2 Koenig, E½ E½ SW 27-22-13e, pumped 5 bbl. oil and 20 bbl. water, Mississippi 1,862-84 ft., T.D. 1,886 ft.

Lost Springs, Marion County: Ring-Mac 2 Jirak, E½ NE NW 4-18-4e, pumped 396 bbl., Mississippi 2.371-96 ft.

McLouth, Jefferson County: Hatcher & Fisk 1 Fowler, SE NW 32-9-20e, dry, Mississippi 1,540 ft., T.D. 1,544 ft.

McLaughlin et al 1 Knudson, SE NW 33-9-20e, gaged 700,000 cu. ft. gas, Mississippi 1,492 ft., T.D. 1,503 ft.

Longwell et al 4 Bankers Life, SW NE SW 3-10-20e, pumped 40 bbl., Bartlesville 1,426 ft., T.D. 1,446 ft.

J. B. Apperson et al 1 Bower, SE SE NE 5-10-20e, pumped 200 bbl., Mississippi 1,440-1,612 ft., T.D. 2,288 ft., P.B. 1,612 ft.

Hatcher & Fisk 1 H. Kimmel, S½ SE SW 5-10-20e, gaged 1,000,000 cu. ft. gas, Bartlesville 1,538-62 ft., T.D. 1,563 ft.

E. V. Jackson 2 McLeod, SW SW SE 5-10-20e, gaged 3,000,000 cu. ft. gas, Bartlesville 1,479 ft., T.D. 1,504 ft.

Peace Creek, Reno County: Cities Service 3 Snowbarger, NE NW NW 22-23-10w, flowed 3,000 bbl., Viola 3,782-86 ft.

Raymond, Rice County: Herndon Drilling et al 1 Kelly, W½ NE SW 15-20-10w, pumped 46 bbl. oil and 53 per cent water, Arbuckle 3,395-97 ft.

Cities Service 1 Specht, NE NE NE 20-20-10w, old well, old T.D. 3,346 ft., P.B. 3,114 ft., dry.

Ritz, McPherson County: Stanolind 6 Lovett, SW SE SW 13-19-2w, old well, old T.D. 3,410 ft. in Viola, P.B. 3,050 ft., Mississippi, pumped 10 bbl. oil and 25 bbl. water.

Silica, Barton County: Phillips 3 Wesley, W½ E½ SW 35-19-10w, potential 3,000 bbl., pumping, Arbuckle 3,280-88 ft.

Earl Wakefield 1 Wolf, S½ SW NE 4-20-11w, dry, Arbuckle 3,335 ft., T.D. 3,342 ft.

Stafford, Stafford County: Stanolind 7 Crawford, W½ NW NE 15-24-12w, flowed 3,000 bbl., Viola 3,838-48 ft.

Trapp, Russell County: Cities Service 4 Bender-C, N½ NE NW 26-15-14w, pumped 98 bbl., Arbuckle 3,354-57 ft.

(Continued on Page 70)

Permian Basin, Panhandle

(Continued from Page 50)

white crystalline lime from 2,740-51 ft. the total depth. It filled 1,000 ft. with oil the first 3 hours and 2,300 ft. in 22 hours. Oil tested 27-gravity. Operators bridged holes back to 2,680 ft. to protect pay zone and have cemented 7-in. casing slightly below that point.

According to R. A. Wilson, Midland, representative of Southern California Petroleum in West Texas and New Mexico, the oil zone logged in 1 Lynch corresponds to the pay horizon of the Hobbs and Vacuum pools. The well is 660 feet out of the southwest corner of Section 21-19s-32e.

Three Wells at Maljamar

The Maljamar pool of Lea County gained two locations and three more producers. Maljamar Oil and Gas Corp. was starting 8-B Baish, 1,980 ft.

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from the south and 660 ft. from the west line of Section 22-17s-32e. W. J. Rutledge and associates staked 2-A Pearsall, 660 ft. out of the southwest corner of Section 33-17s-32e.

Largest of the trio of new Maljamar oilers was the Rutledge No. 1-A Pearsall, in Section 33-17s-32e. (See below.)

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcats

Eddy County: Paul B. English 1 Jones, 24-19s-31e, pumped 65 bbl. in 12 hr. natural, sand 2,461-70 ft., *discovery*.
Keyes & Atwood 1-B Keyes, 33-20s-30e, dry, lime 1,755-56 ft.

Fields

Maljamar, Lea County: Rutledge 1-A Pearsall, 33-17s-32e, flowed 132 bbl. through ¾-in. choke on 2-in. tubing, shot 3,445-60 ft., T.D. 3,490 ft.
Maljamar 16-B William Mitchell, 19-17s-32e, flowed 110 bbl. natural, pay 3,538-86 ft.
Barney Cockburn 10-A Pearl Miller, 23-17s-32e, flowed 60 bbl. natural through 2-in. tubing, pay 3,887-4,085 ft.
Red Lakes, Eddy County: Williams & Ployhar 1 Barrentos, 35-17s-27e, pumped 30 bbl., acid, pay 402-46 ft.
E. L. Fulton 1 Conklin-State, 36-17s-27e, pumped 20 bbl., acid, pay 507-33 ft.
W. D. Cunningham 1 Featherstone-State, 25-17s-27e dry, T.D. 525 ft.
Ployhar & McNutt 2 State, 30-17s-28e, dry, T.D. 575 ft.
Salt Lake, Lea County: Continental 2 E. L. Brooks, 7-20s-33e, pumped 233 bbl., natural, pay 3,075-4[illegible] ft.

Panhandle Gets Increase In New Operations

AMARILLO, Tex.—The Panhandle district had a total of 19 field completions during the week, a gain over the previous week of four. Of the total number of completions, 13 were oil producers and the remaining six were gassers. The oil completions had a daily total potential of 2,847 bbl., and the gassers had a volume of 327,100,000 cu. ft.

During the week a total of 14 new locations were announced for the district, a large increase over the previous week which only had five new locations. Gray County received three locations, 10 for Hutchinson County, and one in Potter County. Carson, Wheeler and Moore counties failed to announce any new starts.

TEXAS PANHANDLE COMPLETIONS

Fields

Carson County: Cities Service 44-A Kilgore, Sec. 43, I.&G.N. Sur., 26,700,000 cu. ft. gas, pay 2,375-2,500 ft., T.D. 2,539 ft.
Skelly 144 Schafer, Sec. 197, I.&G.N. Sur., 68 bbl., pumping, 360-qt. shot 3,043-3,110 ft.
Cree & Hoover 2 Jackson, Sec. 94, Blk. B-2, H.&G.N. Sur., 4,500,000 cu. ft. gas, T.D. 3,154 ft.
Danciger 5 McLaughlin, Sec. 33, Blk. B-2, H.&G.N. Sur., 46 bbl., pumping, 50-qt. shot 2,996-3,031 ft., T.D. 3,255 ft.
Danciger 24 Powell-Beck, Sec. 28, Blk. B-2, H.&G.N. Sur., 63 bbl., pumping, pay 2,805-60 ft., T.D. 2,951 ft.
Danciger 26 Powell-Beck, Sec. 28, Blk. B-2, H.&G.N. Sur., 721 bbl., pumping, pay 2,825-2,928 ft., T.D. 2,929 ft.
Pringle 16 North Volmert, Sec. 140, Blk. 3, I.&G.N. Sur., 47 bbl. in 3 hr., pumping, 150-qt. shot 3,225-70 ft., T.D. 3,276 ft.
Dorsyann Oil Co. 3 B. Bull, Sec. 3, Blk. B-2, H.&G.N. Sur., 70 bbl., pumping, pay 2,995-3,015 ft.
Stanolind 6 Lovett, Sec. 36, Blk. B-2, H.&G.N. Sur., 324 bbl., pumping, 330-qt. shot 2,920-3,046 ft.
Skelly 8 Taylor, Sec. 24, Blk. B-2, H.&G.N. Sur., 243 bbl., pumping, 360-qt. shot 2,835-2,902 ft., T.D. 2,905 ft.
Skelly 9 Taylor, Sec. 24, Blk. B-2, H.&G.N. Sur., 70 bbl., pumping, 510-qt. shot 2,835-2,930 ft., T.D. 2,932 ft.
Hutchinson County: J. M. Crosbie, Inc., 8 Cockrell, Sec. 14, Blk. B-3, D.&S.E. Sur., 195 bbl., pumping, 480-qt. shot 2,765-2,865 ft.
Danube Oil Corp. 12-A Sanford, Sec. 78, Blk. 46, H.&T.C. Sur., 189 bbl., pumping, pay 2,815-24 ft.
E. J. Dunigan 3 Luginbul, Sec. 4, T.W.N.G. Sur., 228 bbl., pumping, 190-qt. shot 3,101-70 ft., T.D. 3,176 ft.
Phillips 63 Whittenburg, Sec. 58, Blk. 46, H.&T.C. Sur., 255 bbl., pumping, 390-qt. shot 3,718-2,833 ft., T.D. 2,835 ft.
Sinclair 71 Johnson, Sec. 31, Blk. Y, A.&B. Sur., 8,000,000 cu. ft. gas, pay 2,320-2,800 ft., T.D. 3,144 ft.
Moore County: Phillips 1 Faye, Sec. 352, Blk. 44, H.&T.C. Sur., 260,000,000 cu. ft. gas, 5,000 gal. acid 2,895-3,045 ft., T.D. 3,152 ft.
Texoma Natural Gas Co. 20-M R. S. Coon, Sec. 152, Blk. 44, H.&T.C. Sur., 15,500,000 cu. ft. gas, pay 2,870-3,261 ft., T.D. 3,509 ft.
Texoma Natural Gas Co. 22-M R. S. Coon, Sec. 186, Blk. 44, H.&T.C. Sur., 11,400,000 cu. ft. gas, pay 2,890-3,270 ft.

La-Arkansas Fields

(Continued from Page 53)

Meadows, the discovery well from the deep zone. Union Producing Co. the past week announced the location of 1-B Meadows, another deep Smackover lime test for the area. It is to be 1,343 ft. west and south of the northeast corner of Section 13-21n-5w, between the discovery and the second well.

The discovery, completed in March of 1941, is in NE Section 18-21n-4w, while the second well is about 1,800 ft. to the west and slightly south and in the SW Section 12-21n-5w. The third operation will be probably the most closely watched deep test ever drilled in North Louisiana since it will undoubtedly offer the key to the 1,600 ft. structural difference between the first and second wells.

New Wildcat Locations

Probably due to both the eased restrictions on drilling material for wildcat wells and also the natural intensity of the Wilcox wildcat play in Central Louisiana, the district received the greatest number of new exploratory starts in many weeks. They are listed as follows:

Avoyelles Parish: Placid Oil 1 Thompson & Katz, SW SW 4-2n-5e.
Caddo Parish: D. C. Richardson Jr. 1 Tri-State, NW NE 27-19n-14w.
La Salle Parish: H. L. Hunt 123-F Goodpine, NE SE 29-7n-3e.
H. L. Hunt 1-B Tensas Delta, SE NE 35-5n-4e.
Phillips 1-H Tensas Delta, SE SW 15-5n-4e.
Phillips 1-C Tensas Delta, SE SW 21-6n-4e.
Natchitoches Parish: Geo. H. Echols 1 U.S.M., NE NE 24-6n-7w.
Winn Parish: H. L. Hunt 72-F Goodpine, NW SE 19-10n-4w.

NORTH LOUISIANA COMPLETIONS

Wildcats

Catahoula Parish: H. L. Hunt 1-D Louisiana Delta Co., NE NW 20-4n-5e, dry at 7,056 ft., no tops released.
Union Parish: Carter Oil 1 W. H. Weldon Unit, NE SW 19-21n-2w, top anhydrite 3,517 ft., base anhydrite 3,810 ft., top James 4,331 ft., Travis Peak 4,980 ft., dry at 5,643 ft.
Winn Parish: H. L. Hunt 12-F Goodpine, NW NW 21-10n-1w, dry at 3,885 ft., no tops released.

Fields

Caddo, Caddo Parish: Burnham Drlg. 1-B Thigpen-Herold, SW NE 34-22n-16w, dry at 2,515 ft.
John M. Curtis 1 G. D. Chiles, NW SE 30-22n-15w, dry at 1,026 ft.
Carterville, Webster Parish: Placid Oil 2 Pine Woods Lbr. Co., irregular Sec. 37-22n-11w, dry at 2,709 ft.
Cypress Bayou, La Salle Parish: Carter Oil 4 Louisiana Delta Co., SW SW SE 12-6n-4e, dry at 4,857 ft.
Homer, Claiborne Parish: Carter Oil 43 Lowenberg, SE SE 13-21n-8w, pumped 12 bbl., 1,389 ft.
Logansport, De Soto Parish: Southern Production Co. 1 Bland Unit, SE NW 11-11n-16w, 102,000,00 cu. ft. gas, perf. casing 4,848-83 ft. and 4,896-4,920 ft., total depth.
Little Creek, La Salle Parish: H. L. Hunt 104-F Goodpine, SE SW 30-9n-2e, 144 bbl. oil and 1 bbl. water, perf. casing 2,486-90 ft., 2,701 ft. total depth.
Placid Oil 1 E. T. Cockerham, SW NW 26-9n-2e, 110 bbl. oil and 6 bbl. water, perf. casing 2,536-42 ft., 2,670 ft. total depth.
Placid Oil 107-F Goodpine, NW SE 25-9n-1e, 34 bbl. oil and 30 bbl. water, perf. casing 2,459-61 ft., 2,706 ft. total depth.
Placid Oil 1 Russell, NE NW 25-9n-1e, 140 bbl. oil and 1 bbl. water, perf. casing 2,444-48 ft., 2,694 ft. total depth.
Nebo, La Salle Parish: T. J. James 1 Graham, NW NW Lot 3, irregular Sec. 40-7n-3e, 134 bbl. oil, no water, perf. casing 3,694-3,702 ft., 4,110 ft. total depth.
Placid Oil 3 Gaharan, irregular Sec. 39-7n-3e, 141 bbl. oil and 7 bbl. water, perf. casing 3,960-66 ft., 4,025 ft. total depth.
Placid Oil 1 Graham, irregular Sec. 39-7n-3e, 137 bbl. oil and 1 bbl. water, perf. casing 3,919-32 ft., 4,031 total depth.
Placid Oil 1 Wright, NE NE 15-7n-3e, 36,000,000 cu. ft. gas, perf. casing 3,986-90 ft., 4,085 ft. total depth.
Placid Oil 2 Wright, SE NE 15-6n-3e, 144 bbl. oil and 3 bbl. water, perf. casing 3,934-44 ft., 4,064 ft. total depth.
Harry Schulman 1 Humphries, NE SW 28-8n-3e, dry at total depth 4,407 ft.
Urania, La Salle Parish: Arkansas Fuel Oil 16 A Tremont SE NE 35-10n-1e, location abandoned.
Arkansas Fuel Oil W-A-10 Urania Lbr. Co., SE SW 2-9n-1e, location abandoned.
Zwolle, Sabine Parish: Manitzas 4 Hale, NE NW 12-7n-13w, location abandoned.

Good Wells Are Brought In At Clayton Pool, Ohio

ZANESVILLE, Ohio.—Completions continued at a fair rate in the Ohio fields in spite of the present restrictions. The Clayton Pool in Perry County yielded 155 bbl. in the center of the pool and 92 bbl. on the western edge.

A 2,600,000 cu. ft. Clinton sand gasser was completed on the southern edge of Brush Creek Gas pool; an offset test in the center of the pool found the Clinton dry with a hole full of water in the Medina.

A wildcat test 6 miles east of Gaysport in Muskingum was a failure through the Clinton at 4740 ft.

OHIO COMPLETIONS

Coshocton County, Pike Township: Fred W. Abbott et al 2 Gilbert Ashcraft and Fulton Bryan, NE Sec. 22, 65 bbl., Clinton sand, T.D. 3,104 ft., will probably make a 40-bbl. pumper.

Fairfield County, Berne Township: City Natural 1 Vernon Dupler, Sec. 11, 120,000 cu. ft. gas, Clinton, T.D. 2,509 ft.

Knox County, Union Township: Ohio Fuel 1 Glen Ferenbaugh, Sec. 24, show oil and gas, Clinton 2,959-3,007 ft., T.D. 3,050 ft., plugged.

Holmes County, Monroe Township: Ohio Fuel 1 Margaret Hall, Sec. 32, dry, Clinton, T.D. 3,300 ft.

Licking County, Madison Township: Ohio Fuel 2 Homer Shaw, Lot 10, second quarter, 1,950,000 cu. ft. gas, Clinton 2,505-38 ft., T.D. 2,544 ft.

Mary Ann Township: Settles Oil 7 Phil Shannon, fourth quarter, 11 bbl., shot, Berea, T.D. 718 ft.

Lorain County, Carlisle Township: McMillen Co. 2 William Youngeberg, Sec. 18, 730,000 cu. ft. gas, Clinton, T.D. 2,316 ft.

Medina County, Hinckley Township: Snyder et al 1 C. H. New, Lot 53, 300,000 cu. ft. gas, Clinton, T.D. 3,480 ft.

William Dempsey 1 C. E. Neal, Lot 31, dry, Clinton T.D. 3,458 ft.

Meigs County, Rutland Township: H. M. Nelson 1 A. D. Smith, Sec. 21, 25,000 cu. ft. gas, plugged, Maxon (water), T.D. 980 ft.

Monroe County, Washington Township: H. B. Walker & Co. 15 W. S. English, SW Sec. 5, ½-bbl. pumper, Injun sand, T.D. 1,432 ft.

Morgan County, York Township: Industrial Gas 1 C. E. Bailey, Sec. 22, 2,600,000 cu. ft. gas, Clinton, T.D. 4,257 ft.

Muskingum County, Harrison Township: Industrial Gas 7 Charles Enoch, Sec. 2, Clinton 4,070-4,125 ft., dry, Medina 4,183-93 ft., H.F.W.

Meigs Township: Columbus Clay & Mineral Co. 1 C. E. James, Sec. 17, plugged, Clinton 4,600-40 ft., small show gas at 4,625 ft., Red Rock 4,712 ft., T.D. 4,740 ft.

Noble County, Marion Township: H. G. Clymer 1 C. M. Archer, Sec. 14, dry, Berea, T.D. 1,680 ft.

Perry County, Clayton Township: Preston Oil 3 William Thompson, Sec. 8, 155 bbl., shot, Clinton 3,230-78 ft., T.D. 3,283 ft.

Preston Oil 1 Ernest F. Smithley, Sec. 7, 92 bbl., shot, Clinton 3,135-73 ft., T.D. 3,190 ft.

Thorn Township: B. Davis et al 5 W. L. Starkey, Sec. 13, dry, Clinton 2,680-2,712 ft., T.D. 2,760 ft.

Stark County, Pike Township: Belden et al 1 O. C. Barber, Sec. 10, 1,600,000 cu. ft. gas, shot, Clinton, T.D. 4,819 ft.

Tuscarawas County, Sandy Township: Status Dev. Co., Lot 33, 1,250,000 cu. ft. gas, shot, Clinton, 1,250,000 cu. ft. gas, T.D. 4,862 ft.

East Ohio Gas 1 Thurman Bailey, Lot 3, 450,000 cu ft. gas, shot, Clinton, T.D. 4,973 ft.

Washington County, Liberty Township: William Dempsey 6 Walter Heckathorn, Sec. 1, 4 bbl., shot, Injun, T.D. 1,310 ft.

Ludlow Township: Harry Binegar 1 fee, SW Sec. 25 dry, Salt sand, T.D. 1,000 ft.

Indiana Prospective Pool Opener Is Dry

EVANSVILLE, Ind.—The surprise of the Illinois-Indiana basin area come from Maner Graham 1 Archie Thompson, hailed as a prospective pool opener early last week, but which was later reported dry at a total depth 2,685 ft. The well swabbed between 8 and 10 bbl. of oil an hour after plug was drilled to McClosky saturation but water broke in within a short time. Water was eliminated and the well again began making some oil which was soon exhausted.

WESTERN KENTUCKY COMPLETIONS

Christian County, Crofton district: Henry Myers 1 Kentucky Store Land, dry, T.D. 1,768 ft.

Daviess County, Livia district: Ankany & Gibson 2 Mrs. W. T. Thorp, 25 bbl., shot, Jones sand 1,615-27 ft., T.D. 1,637 ft.

Henderson County, Niagara district: Schneider & Guinn 4 Bettie Moss, 10 bbl., shot, stray sand 675-90 ft.

Ohio County, Fordsville district: Tuttle 4 Grace Miles, dry, T.D. 266 ft.

Todd County, Daysville district: Rex-Pyramid 1 Jim Gordon, dry, T.D. 1,432 ft.

Union County, Morganfield district: Sun and Kentucky Natural Gas 2 Sloan McKinney, 60 bbl., stray sand, T.D. 1,359 ft.

Oklahoma Fields

(Continued from Page 49)

Barnsdall 5 Osage, W½ E½ NE 10-24-11, dry, Bartlesville 1,789 ft., T.D. 1,880 ft.

Pure 127 Osage, SW NE SE 8-23-8, old well, old T.D. 2,163 ft., T.D. 2,511 ft., pumped 40 bbl.

Moore Oil 1 Osage, SW SW NW 35-22-8, old well, old T.D. 2,012 ft., T.D. 2,105 ft., pumped 40 bbl.

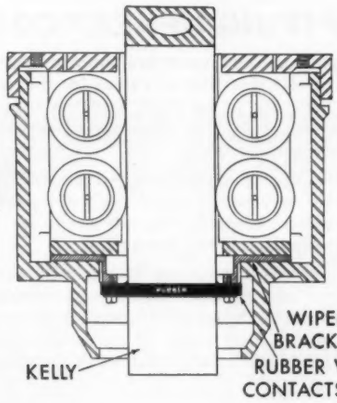
Barnsdall 23 Osage, E½ NE 30-21-9, old well, old T.D. 359 ft., T.D. 370 ft., pumped 10 bbl.

Pawnee County: Johnson 3-A Rogers, SE NE NW 12-20-7, old well, old T.D. 2,441 ft., T.D. 2,927 ft., P.B. 2,490 ft., pumped 20 bbl.

Pontotoc County: Minnick 1-A Fagan, NW NW NE 34-5-7, surface hole, abandoned.

Bishop 2 McCurry, NE SE NW 15-4-6, pumped 25 bbl., sand 814 ft., T.D. 823 ft.

Tulsa County: Nute 1 Trendwell, NW NW SW 11-19-14, dry, T.D. 400 ft.



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MICHIGAN OPERATIONS

Ruling Permits Completion Of 170 Close-Spaced Wells

By OTTO C. PRESSPRICH

SAGINAW, Mich. — Michigan oil and gas-well operators last week received permission from the federal petroleum administration to complete approximately 170 tests which had been spudded in before December 23. A previous regulation had ordered Michigan drilling confined to 40-acre tracts, but because many of the tests had been started on the usual 10 or 20-acre locations, the permit relaxing the order was obtained by P. J. Hoffmaster, state supervisor of wells. Hoffmaster also had asked that the limit be changed to permit drilling at all sites to which roads had been built and materials delivered. However, the coordinator's office held that drilling must actually have started prior to December 23.

While this action will permit some pickup in the Michigan oil industry, conditions were reflected in a reduction in the number of drilling permits approved by the state last week, the total being only eight—three for Van Buren county, one each for Roscommon, Ottawa, Allegan, Arenac and Tuscola locations. The permits thus far this year total only 17. Operators, however, have purchased leases on 61,000 acres more of state-owned lands made available the weekend of January 1.

The sale brought more than 350,000 acres of state lands under lease and top price was J. V. Wicklund's bid of $18,075 for a 40-acre parcel in Roscommon county adjacent to the proven areaa. Leading bidders were Sun Oil Co., Saginaw; C. L. Maguire, Mt. Pleasant; Ohio Oil Co., Mt. Pleasant; Freeman Oil Co., Clare; Rex Oil & Gas Co., Muskegon; Carter Oil Co., Tulsa, and Walter McClanahan, Standish. Acreage was leased in Arenac, Clare, Crawford, Isabella, Kalakaska, Mecosta, Missaukee, Newaygo, Osceola and Roscommon counties.

MICHIGAN COMPLETIONS

Bay County, Kawkawlin Township: Gulf Refining Co. 2 Friebe, C N½ SW NE 34-15n-4e, 126 bbl., acid, T.D. 2,936 ft.

Clare County, Winterfield Township: Taggart Bros. 97 Landers-Schuett-Tjaisma, C SW 20-20n-6w, 16,650,000 cu. ft. gas, T.D. 1,370 ft.

Cities Service Oil Co. 2 Phares, C W½ NE SE Sec. 29, 45 bbl., T.D. 3,743 ft.

Lake County, Pinora Township: Ohio Oil Co. 2 Pfuhl, C N½ SE SE 24-18n-11w, 2,400 bbl., T.D. 2,950 ft.

Pure Oil Co. 2 Morrison, C N½ NE NE Sec. 35, 175 bbl., ¼-in. choke, T.D. 2,932 ft.

Osceola County, Lincoln Township: Pure Oil Co. 4 Brock, C N½ SE SW 20-18n-10w, 13,162 bbl., T.D. 3,558 ft.

Ohio Oil Co. 4 Cooper-Ryan, C S½ SE SW Sec. 29, 420 bbl. first 20 hr., T.D. 3,572 ft.

Charles W. Teater 4 Baderschneider, C N½ SW NW Sec. 30, 100 bbl., acidized, T.D. 3,620 ft.

Ohio Oil Co. 1 Gocha-Hewitt, C N½ SE NW Sec. 32, 1,236 bbl., T.D. 3,607 ft.

Roscommon County, Nester Township: Grabe Oil Co. 1 Halestro Reserve, Inc., NW SE NE 9-21n-1w, wildcat, dry, T.D. 4,096 ft.

Roscommon Township: Sun Oil Co. 1-A State, C N½ NE SW 30-21n-3w, 1,200 bbl., T.D. 3,425 ft.

Pure Oil Co. 2-B State, C S½ SW NW Sec. 34, 1,560 bbl., T.D. 3,404 ft.

Van Buren County, Bloomingdale Township: John F. Burton 2 Ampey, SE NE SE 2-1s-14w, pumping, 70 bbl., acidized, T.D. 1,350 ft.

Appalachian Fields

(Continued from Page 57)

Putnam County, Curry district: Summit Gas Co. 2 Mary (Edna) L. Wood, 852,000 cu. ft. gas, Big lime 1,468 ft., gas 1,520-21 ft., T.D. 1,521 ft.

Hunter Gas Co. 1 J. A. Johnson, 179,000 cu. ft. gas, Berea 2,340-65 ft., shot, R.P. 530 lb. 12 hr., T.D. 2,373 ft.

Wayne County, Union Township: Owens, Libby-Owens 1 Hiram Ferguson, 73,000 cu. ft. gas after shot, Brown shale 2,576-3,016 ft., T.D. 3,024 ft.

ORISKANY COMPLETIONS

Jackson County, Ravenswood district: Columbian Carbon Co. 1 Samuel Davis, dry and abandoned, Corniferous lime 4,859 ft., Oriskany 4,985 ft., T.D. 5,065 ft.

Ripley district: Howard Bartlett 1 Harmar, Wandling & Simmons, 4,162,000 cu. ft. gas, Oriskany 5,332-62 ft., R.P. 1,840 lb. 24 hr., T.D. 5,362 ft.

United Carbon Co. 973 P. C. Green, 7,556,000 cu. ft. gas, Oriskany 5,202 ft., gas 5,206-26 ft., T.D. 5,232 ft., R.P. 1,840 lb. in 24 hr.

Washington district: Godfrey L. Cabot 1 Dora Aldeman, 16,004,000 cu. ft. gas before shot, Oriskany 5,243 ft., T.D. 5,245 ft., R.P. 1,900 lb.

Putnam County, Union district: Godfrey L. Cabot 24 Putnam Co., 919,000 cu. ft. gas, Oriskany 5,130 ft., shot 5,133-59 ft., R.P. 1,200 lb. 69 hr., T.D. 5,205 ft.

Kanawha County, Poca district: Godfrey L. Cabot, Inc. 1 Martha Taylor heirs, 18,500,000 cu. ft. gas, Corniferous lime 5,288 ft., Oriskany 5,416 ft., R.P. 1,675 lb., T.D. 5,440 ft.

Godfrey L. Cabot, Inc. 25 Putnam Co., 622,000 cu. ft. gas, Oriskany 5,063 ft., shot 5,066-98 ft., T.D. 5,138 ft.

Godfrey L. Cabot, Inc. 28 Putnam Co., 1,524,000 cu. ft. gas, Oriskany 5,016 ft., shot 5,017-37 ft., T.D. 5,099 ft.

Columbian Carbon Co. 1 Norma Haynes, 18,108,000 cu. ft. gas, before shot, Oriskany 5,308 ft., T.D. 5,336 ft.

Poca Fork Oil & Gas 1 Amos Haynes, 6,755,000 cu. ft. gas, Corniferous lime 5,123 ft., Oriskany 5,263 ft., shot 5,261-93 ft., T.D. 5,329 ft.

Rex Oil & Gas Co. 1 John W. Harding (shallow test), dry, through Salt sand, T.D. 1,459 ft.

Eastern Texas Fields

(Continued from Page 64)

Frammell, A. C. Kyser Sur., 1,200,000 cu. ft. gas in 24 hr., S.I., T.D. 2,980 ft.

Hawkins, Wood County: Stanolind 1 Christian Women's Board of Missions, S. Castleberry Sur., 92 bbl. in 8 hr., ¼-in. choke, top Austin 4,217 ft., top Woodbine 4,420 ft., pay 4,517-4,672 ft., T.D. 4,885 ft.

Stanolind 5 C. C. Miller, J. P. Moseley Sur., 102 bbl. in 6 hr., ¼-in. choke, pay 4,770-80 ft., T.D. 4,871 ft.

Texas 6 R. A. and R. M. Cobb, J. G. Heard Sur., 86 bbl. in 6 hr., ¼-in. choke, pay 4,720-64 ft., T.D. 4,826 ft.

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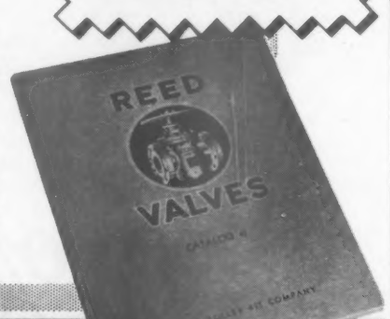

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SOUTHWEST TEXAS

Deep Test at Carolina-Texas Field Holding Attention

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Operators interested in Wilcox sand development in Southwest Texas centered their attention on the Carolina-Texas field, Webb County, where Continental Oil Co. and Transwestern Oil Co. were running casing in Houston Oil Co. well located on the west flank of the structure in Section 268. With the hole bottomed at 9,224 ft., 6-in. casing was being run after an electrical survey and a series of sidewall cores were taken. Details as to what was shown by the survey and cores were not available.

This structure was found in 1921, and while it has produced some oil, production has been mostly gas. It is a large structure extending in a northeast-southwest direction through several sections. Most of the production has been from the upper Jackson series, although some wells have produced from the Queen City below 5,000 ft. The well is the deepest to be drilled on the structure and the outcome is being watched with much interest.

New Field in Webb County

Webb County gained another field as O. W. Killam 1 Marrs McLean 6 miles southeast of the Mirando City field flowed 288 bbl. of 55-gravity distillate while testing through a ¼-in. choke. Total depth of the well is 4,016 ft., and production is through perforated casing at 3,240-48 ft. The sand section is believed to be the Yegua. The field is located in Survey 610, due west of the O'Hern field.

Government Wells Again

Sun Oil Co. added another producing sand to the Government Wells field, Duval County as 77-A Wiederkehr, Survey 55, pumped 123 bbl. of oil daily from sand topped at 1,820 ft. An electrical survey showed the sand from 1,820-30 ft., and it is tentatively identified as the "Chernosky." The well is a short distance from 75 Wiederkehr, ½-mile west of the field which opened new production the past year in the Yegua sand at 2,934-40 ft. This sand in 77-A Wiederkehr was found to carry gas.

Other Wildcats Showing

T. B. Slick, Jr., et al 1 Grissom, 1 mile south of the Caesar field, Bee County, is reported to have flowed 27 bbl. of 47 gravity oil in 18 hr. through 6/64-in. choke . . . Southern Minerals 2 C. B. Stilwell, a deep sand discovery for the Alice field, Jim Wells County, was allowed to clean itself, and flowed an estimated 40 bbl. of 49-gravity oily distillate daily through a ⅛-in. choke . . . In the southern part of the county in the Von Blucher area, Shell 1 Seeligson, recovered 240 ft. of 29.6 gravity oil and tested 35 lb. working pressure on a 17-minute drill-stem test at 5,129-38 ft.

LOWER GULF COAST COMPLETIONS

Wildcats

Jim Wells County: Gorman & Yoakum 1 L. L. Allen, dry, T.D. 5,378 ft.
Kilgore Developers 1 Schmidt, dry, T.D. 5,631 ft.
San Patricio County: L. A. Douglas 1 Ragsdale, dry, T.D. 7,120 ft.
Forrest Development Co. 1 Henry, dry, T.D. 5,958 ft.

Fields

Agua Dulce, Nueces County: Graham 1 Saens, 175 bbl., open flow, T.D. 7,060 ft.
Graham 1 Teachart, 185 bbl., open flow, perf. casing 6,897-6,928 ft., T.D. 6,950 ft.
Ben Bolt, Jim Wells County: Earl Calloway 1-C Smith, dry, T.D. 5,512 ft.
Clara Driscoll, Nueces County: Texas Conservative 4 Taylor, 127 bbl., ⅛-in. choke, perf. casing 4,982-88 ft., T.D. 5,425 ft.
Greta, Refugio County: Monday Oil Co. 1 Heard, 75 bbl. oil, plus 12 per cent salt water, ⅛-in. choke, T.D. 4,445 ft.
Midway, San Patricio County: Phillips 7 Ivey, 83 bbl. oil and 846 bbl. salt water, ⅝-in. choke, perf. casing 5,330-33 ft., T.D. 5,385 ft.
Minnie Bock, Nueces County: Phillips 2 Willgan, dry, T.D. 7,510 ft.
Odem, San Patricio County: Seaboard 5 Smith, 103 bbl., ⅛-in. choke, perf. casing 5,423-28½ ft., T.D. 5,434 ft.
Orange Grove, Jim Wells County: Rand Morgan 1-H fee, 25 bbl., 9/64-in. choke, perf. casing 3,783-88 ft., T.D. 6,000 ft.
Plymouth, San Patricio County: Plymouth 122-C Weld er, 122 bbl., 7/64-in. choke, perf. casing 6,146-48 ft., T.D. 6,148 ft.
Petronilla, Nueces County: Sinclair Prairie 1 J. R. Knight, dry, T.D. 7,520 ft.
Refugio, Refugio County: Hewitt & Dougherty 1 Morgan Vance, 132 bbl., 5/32-in. choke, perf. casing 6,231-37 ft., T.D. 6,245 ft.
Stratton, Kleberg County: Humble 7 King, 116 bbl., ⅛-in. choke, T.D. 6,643 ft.

LAREDO DISTRICT

Wildcats

Duval County: A. L. Slaughter 1 Dee, dry, T.D. 3,351 ft.
Tom Graham 2 Villareal, dry, T.D. 6,200 ft.

Fields

Chaparosa, Jim Hogg County: Adams, Lucky and Neuhaus 1 T. T. East, 75 bbl., ¼-in. choke, sand 3,462-71 ft.
Colorado, Jim Hogg County: Humble 50-B King, dry, T.D. 2,841 ft.
Kreis, Duval County: W. C. McBride 2 Fite, dry, T.D. 3,256 ft.
Newman Brothers 1 Garza, 30 bbl., pumping, sand 3,305-12 ft.
Las Animas, Jim Hogg County: Sollars Royalty Co. 10 McLean, 25 bbl. oil and 75 bbl. salt water, ⅝-in. choke, T.D. 1,815 ft.
Piedra De Lumbre, Duval County: Magnolia 34 Duval County Ranch Co., dry, T.D. 2,200 ft.
Rincon, Starr County: Continental 66-A Slick, 238 bbl., ⅞-in. choke, perf. casing 4,102-20 ft., T.D. 4,185 ft
Continental 60-B Slick, 229 bbl., ⅞-in. choke, perf. casing 4,001-23 ft., T.D. 4,630 ft.
Continental 61-B Slick, 229 bbl., ⅞-in. choke, perf. casing 3,983-88 ft., T.D. 4,240 ft.
Continental 1-D Garcia, 233 bbl., 3 bbl. salt water, ⅞-in. choke, perf. casing 3,912-28 ft., T.D. 4,105 ft.
Sejita, Duval County: Trinity Gas Co. 1 Barrera, 356,-

(Continued on Page 70)

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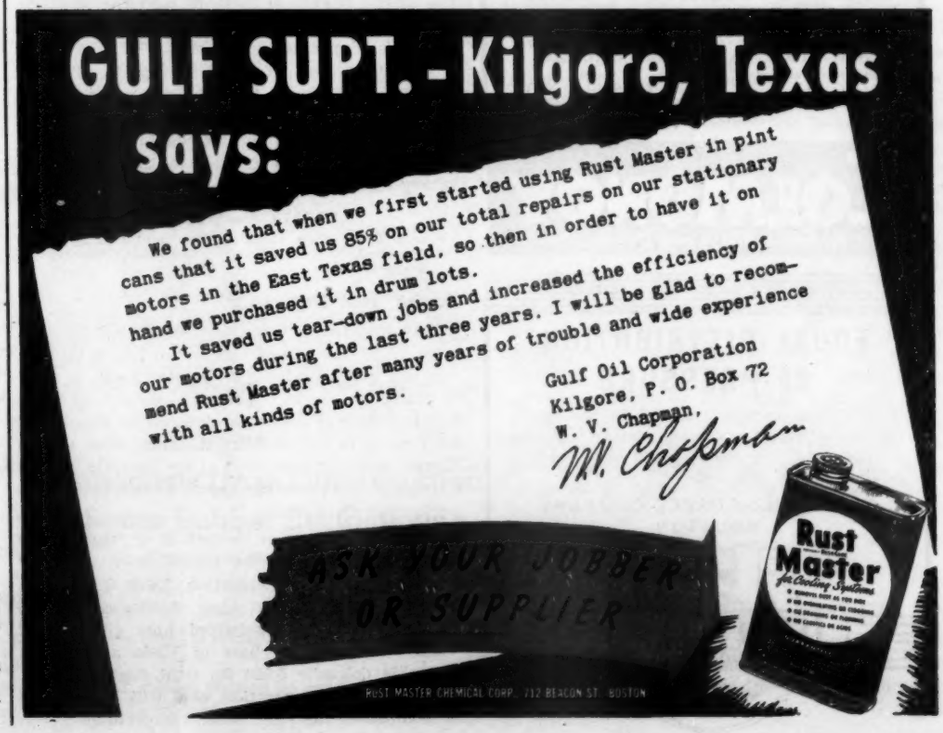
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Deep Test Near Dakota Border Abandoned Above 10,000 Ft.

By T. R. INGRAM

DENVER, Colo. — Completions in the Rocky Mountain area were confined to two wells, the small number being due to the cold weather which caused every well in some fields to be shut down.

The Carter Oil Co. 1 Northern Pacific unit, C SE SW 19-4n-62e, on the Little Beaver dome of the Baker-Glendive anticline in eastern Montana, which spudded last May with the expectation that it might go to 11,000 ft., was plugged and abandoned at 9,678 ft., 24 ft. in schist. It tested the Pennsylvanian, Mississippian and Devonian, and had shows in several horizons, but after extensive testing they were found to be noncommercial. Upon the outcome of this test hinged plans for extensive wildcatting in eastern Montana and the Dakotas.

The Montana-Dakota Utilities 1 State, C SE 6-34n-4w, ¾ mile SE of its 1 Dahlquist, 11 miles west of Kevin and NE of the Cut Bank gas field, a gas discovery for 6,600,000 cu. ft. last year, will make an extension of the proven area. It was drilled to 2,147 ft. and on a drill-stem test showed for 1,300,000 cu. ft. before setting the 7-in. at 2,106 ft. preliminary to testing the Cut Bank sand.

The Santa Rita Oil & Gas Co. 15 Tribal, SW SE NE 3-35n-6w, an outpost on the west side of Cut Bank, which swabbed 468 bbl. first 24 hours from the Sunburst sand last December, flowed an average of 180 bbl. on a 10-day test.

Wyoming Wells Testing

Husky Refining Co. 2 Stump, SE SW SW 21-53n-101w, a test on the top of the Cody (Shoshone) dome, Park County, Wyoming, which appears to be running several hundred feet higher than Paul Stock 1 Rosseau, ½ mile to the northwest, which made 200 bbl. a day, topped the Embar at 4,395 ft., set the 7-in. at 4,390 ft., drilled to 4,411 ft., and is preparing to test.

Ohio Oil Co. 3 Diamond Cattle, SW NE SE 27-20n-78w, an outpost on the north side of Rock River field, Carbon County, Wyoming, had the top of the Dakota at 3,425 ft., and the Morrison at 3,502 ft., the 6⅝-in. was cemented at 3,365 ft. and it is preparing to test at 3,517 ft.

Sinclair-Wyoming Oil Co. 8 Hughest, SW cor. 2-26n-90w, an outpost ⅛ mile north of production in the Tensleep in the Lost Soldier field, Sweetwater County, Wyoming, set the 7-in. at 4,074 ft., topped the Tensleep at 4,084 ft., and is running tubing to test at 4,450 ft.

LOCATIONS—WYOMING

Frannie field, Park County: Continental 3 Northern Pacific-3, NE SE NW 23-58n-98w, moving in material.

Border Test Dry

Stanolind Oil & Gas Co. 1 Snell, SE 7-20-41w, some 10 miles south of Towner, in Kiowa County, was dry and abandoned at a total depth of 5,991 ft. with no shows, operators announced. The test has been of particular interest to Kansas oil men as it is but a short distance west of the Kansas line and northwest of the recently opened Patterson pool, remote western outpost of oil production in Kansas.

The Snell has been carried as a "tight" hole but upon completion the following details were announced: Surface elevation 3,853 ft., top of Cherokee shale 4,510 ft., top of Mississippi lime 5,060 ft., base of Mississippi lime and top of Viola lime 5,785 ft., base of Viola and top of Arbuckle dolomite 5,920 ft., total depth 5,994 ft. Samples on this operation now will be released to companies desiring them for testing.

Southwest Texas Fields

(Continued from Page 69)

000 cu. ft. gas, open flow, perf. casing 5,586-5,60[illegible] ft., T.D. 5,900 ft.

Seven Sisters, Duval County: S. C. Creech 1 Chernosky, 33½ bbl., pumping, sand 2,246-50 ft.

Yturria, Starr County: Sun 3-A Chapotal, 66 bbl. oil 12 hr., 3/32-in. choke, sand 4,230-32 ft.

SOUTH CENTRAL TEXAS

Fields

Carrizo, Dimmit County: Walton Drilling 1 McKnight, dry, T.D. 2,318 ft.

Gas Ridge, Bexar County: Rip Pipe & Supply 2 Sweeney, dry, T.D. 652 ft.

Southwest Drilling Co. 23 Covell, 2 bbl., pumping, sand 418-75 ft.

Rip Pipe & Supply Co. 1 Sweeney, dry, T.D. 565 ft.

Southwest Drilling Co. 42 Covell, 2 bbl., pumping, sand 405-60 ft.

Lentz, Bastrop County: Wiegand Brothers 1 Lehman, dry, T.D. 2,275 ft.

Texas Gulf Coast Fields

(Continued from Page 63)

Texas 2 Sillman, 153 bbl., ⅛-in. choke, perf. casing 6,422-25 ft., T.D. 6,698 ft.

Hull, Liberty County: Gulf 21 Scarborough, 333 bbl. [illegible]-in. choke, perf. casing 5,966-6,004 ft., T.D. 6,015 ft.

South Oil Co. 2 Merchant, 105 bbl., 3/32-in. choke, T.D. 6,958 ft., P.B. T.D. 6,593 ft.

Lolita, Jackson County: Magnolia 23 Mitchell, 132 bbl., 7/64-in. choke, perf. casing 5,933-36 ft., T.D. 5,940 ft.

Lovells Lake, Jefferson County: Humble 3 Beaumont Launch Club, 148 bbl. oil, plus 3 per cent salt water, ⅛-in. choke, perf. casing 7,723-24 ft., T.D. 7,807 ft.

Magnet, Wharton County: Humble 51 Cockburn, 28 bbl., 3/32-in. choke, T.D. 5,536 ft.

Manvel, Brazoria County: Texas 1-C Way, dry, T.D. 4,850 ft.

Maurbro, Jackson County: Humble 4 Drushel, 504 bbl., ¼-in. choke, perf. casing 5,214-21 ft., T.D. 5,240 ft.

Humble 7-B Mauritz, 384 bbl., ¼-in. choke, sand 5,219-34 ft.

Humble 5 Strauss, 390 bbl., ¼-in. choke, sand 5,217-27 ft.

Mykawa, Harris County: West Production Co. 3 W. H Irwin, 70 bbl. oil and 175 bbl. salt water, pumping, T.D. 6,080 ft.

North La Ward, Jackson County: Humble 1 Four Way ranch, 552 bbl., ¼-in. choke, sand 5,209-15 ft.

Moore & Ahren 3 Burdett, 419 bbl., [illegible]-in. choke, perf. casing 5,211-19 ft., T.D. 5,225 ft.

Moore & Ahren 2 Olsovsky, 74 bbl., ¼-in. choke, T.D. 5,229 ft., P.B. T.D. 5,224 ft.

Northwest Mauritz, Jackson County: J. G. Mayo et al 1 A. C. Rodesney, 115 bbl., ⅛-in. choke, perf. casing 5,408-14 ft., T.D. 7,808 ft.

Ogburn, Harris County: Joyce Richardson 1-B Backen, gas-distillate producer, no gage, perf. casing 6,910-34 ft., T.D. 6,970 ft.

West Beaumont, Jefferson County: Stanolind 1 Treadway Land Co., 70 bbl., ¼-in. choke, T.D. 5,389 ft.

West Ranch, Jackson County: Magnolia 6 J. M. Bennett, 105 bbl., 7/64-in. choke, perf. casing 5,593-98 ft., T.D. 5,759 ft.

Magnolia 229-A West ranch, 149 bbl., ⅛-in. choke perf. casing 5,542-52 ft., T.D. 5,553 ft.

Withers, Wharton County: Texas 80-B Pierce, 75 bbl., ⅛-in. choke, perf. casing 5,537-40 ft., T.D. 5,560 ft.

Kansas Fields

(Continued from Page 65)

Leader Oil 3 Perry, SW SE NE 33-15-13w, pumped 105 bbl. oil plus 50 per cent water, Arbuckle 3,339½-42 ft.

Skelly 1 Susank, NW NW NE 19-16-13w, pumped 506 bbl. oil and 25 bbl. water, Lansing 3,137-45 ft. and 3,206-18 ft., T.D. 3,352½ ft., P.B. 3,332 ft.

West Trapp, Russell County: Phillips and Continental 3 Krug, S½ SE 15-15-14w, pumped 27 bbl. oil, 90 per cent water, Arbuckle 3,319-22 ft., T.D. 3,324 ft.

Virgil, Greenwood County: Oko Oil & Gas 22 Shadel, NE NW SE 15-23-13e, pumped 35 bbl. oil, Mississippi 1,799-1,803 ft.

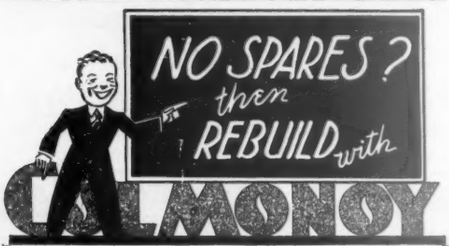
Wellman gas, Rice County: B. & R. Drilling 1 Hand, E½ E½ 21-21-9w, gaged 13,860,000 cu. ft. gas, Misener 3,318½-22 ft.

Miscellaneous

Butler County: Rex & Morris et al 4 De Moss-B, SE NE SW 5-28-7e, pumped 25 bbl., Bartlesville 2,700-23 ft.

Third Producer Brought in At Ogle Pool, Nebraska

ST. JOSEPH, Mo.—Skelly Oil Co. was preparing to test 1 Zimmerman in the Barada pool last week. had 1 Mary Mack near the Hunton lime and was starting at 6 Roesch. In the Ogle (Dawson) pool A. H. Kruger of Russell, Kan., and his associates brought in 1 Ogle for the third well of the pool. The hole filled 1,100 ft. after acidization with 500 gal. of acid and could not be bailed down.



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Revision of Turner Valley Proration Plan Considered

By VICTOR LAURISTON

CHATHAM, Ont.—Dr. George Grainger Brown, professor of chemistry at the University of Michigan, who last fall was engaged by the Alberta Conservation Board to make a survey of the Turner Valley field and determine the best method of operation to secure the maximum oil yield with the minimum waste of gas, has presented a report recommending drastic changes in present methods. In place of the present stabilized quota of 26,000 bbl. daily for the entire field, he recommended that a maximum volume rate of withdrawal of reservoir fluid (oil and gas) per acre per day be applied to all wells, whether classified as oil or gas wells.

This maximum woud be set at 25 bbl. per acre per day. The established acreage unit for each well is 40 acres, and it is recommended that even where adjacent leases are controlled by the same operator, the acreage be not increased by more than 26 acres. For a normal 40-acre tract, the reservoir fluid allotment per day would be 1,000 bbl. This would probably restrict production of wells with a high gas-oil ratio, while allowing practically maximum production of crude oil where the ratio is low. Crude production under the scheme would approximate the present allowable, 26,000 bbl. daily, with a possibility of 27,000 bbl., but it could be expected to increase as new wells with low gas-oil ratios are opened.

J. J. Frawley, acting chairman of the Alberta Conservation Board, has announced that the present aggregate daily allowable of 26,000 bbl. for Turner Valley crude wells, maintained throughout 1941, has been rescinded and that Dr. Brown's recommendations are being studied by the board, and, if satisfactory, will be adopted perhaps in a modified form.

Meantime it was announced crude production from Alberta during November totaled 815,087 bbl., or 27,170 bbl. daily, an increase of 449 bbl. daily over October, but a decrease of 1,170 bbl. daily from November 1940. This production was supplemented by 27,563 bbl. of natural gasoline from Turner Valley absorption plants in November, or 919 bbl. daily, an increase of 105 bbl. daily over October and 19 bbl. daily over November 1940. The total did not include oil recovered from bituminous sands at McMurray in northern Alberta, where a fire in November caused considerable damage to the plant.

The October production included 804,069 bbl. of limestone crude, 2,388 bbl. of limestone naphtha and 444 bbl. of shallow crude from Turner Valley; Red Coulee light crude, 902 bbl.; Wainwright heavy crude, 1,067 bbl.; Del Bonita light crude, 591 bbl.; Steveville-Princess light crude, 2,447 bbl.; Taber medium crude, 190 bbl.; Vermilion heavy crude, 2,989 bbl. There were 225 producing wells in Turner Valley and 23 in outside fields.

Weekly Production

Crude and natural-gasoline production from all Alberta fields for the week ending January 5 averaged 27,075 bbl. daily, compared with 26,928 bbl. daily for the previous week and 23,207 bbl. daily for the corresponding week last year. The daily average includes 25,883 bbl. of crude and 919 bbl. of natural gasoline from Turner Valley and 273 bbl. of crude from outside fields. There were 199 crude producers, 36 wells drilling, 6 testing, 3 standing, and 2 new drilling licenses issued.

Crude petroleum stocks in Alberta as of December 1 amounted to 386,191 bbl., an increase of 5,350 bbl. over November 1, but a decrease of 152,450 bbl. compared with December 1, 1940. Refined petroleum stocks as of November 1 amounted to 809,437 bbl., a decrease of 52,145 bbl. from October 1 and 162,567 bbl. from November 1, 1940.

A block of 9,600 acres in the Stoney Indian Reserve, north of the Bow River, leased by John C. Dallas from the federal government, will be drilled by Roxana Petroleums, Ltd., after preliminary geological investigation which will start as soon as weather permits. Acreage is in Township 26-6w5, on the northwestern strike between North Turner Valley and the semiproven Grease Creek area.

Clommel Petroleums, sponsored by Toronto interests, has located its No. 1 test on the Bruderheim structure north of Edmonton. Location is in LSD 4, 32-55-20w4. The area is previously untested.

Vermilion Field

Conditioning plant erected by Vermilion Consolidated Oils at Borrodaile, Alta., has been completed and is starting its test runs. The plant is designed to process the Vermilion heavy crude for use as fuel oil. Tentative contracts with transcontinental railroads have ensured an extensive market if the crude can be successfully treated. Crude from several producing wells has been stored in a pit at the plant, and will be utilized in the initial tests. A number of completed wells are shut in, but plans have been worked out for extensive drilling to start in the spring. Two new locations have recently been made. Princeville 3, LSD 8, 31-50-5w4 and Flobell 1, LSD 12, 29-50-5w4.

Saskatchewan Operations

Operations will be carried on in 1941 in the Lloydminster and Unity areas of western Saskatchewan by Franco Oils, headed by Walter F. Thorn. The company will drill two wells in the Lloydminster field at a cost of $40,000 and one at Muddy Lake in the Unity district at a cost of $25,000. Drilling will start early in the spring. In addition, reconditioning of all the existing wells in the Lloydminster field will be undertaken. The drilling follows seismographic operations carried on last year in the Muddy Lake and Vera districts, which indicated good drilling prospects.

Economists Urge Liberalization Of Some Rubber Restrictions

(Continued from Page 11)

recapping and retreading by as much as 40 per cent above 1941 levels.

The slightly abridged text of their analysis follows:

The difficulties created by the unavailability of crude rubber for general automotive use are very real although not as immediate perhaps as popularly apprehended. A number of considerations lead to the conviction that the inventory of available tire mileage is quite large and capable, if properly managed, of sustaining operations at a fairly high level for a considerable period. Existing tires on vehicles have an estimated future life of 12,000 miles or about 1⅛ years and much more with care and reduced speeds; large numbers of partly worn casings not now on vehicles are available; marginal mileage will be fully utilized; and recapping can be made to extend useful tire life several years.

Expedients will keep a large percentage of cars on the highways in 1942, but retreading and recapping must be made widely available next year to sustain the use of automobiles without substantial impairment. This supporting factor can be assured only if a cooperative program for the full utilization of scrap rubber is adopted by the oil and rubber companies with Government consent.

Stock Estimated at Million Tons

The stock of used rubber disseminated throughout the country is not known but has been estimated to be at least 1,000,000 tons, and the quantity of rubber required to recap a tire is only one-third of that needed to make a new tire. A ton of reclaimed rubber can provide more than twice the mileage available from a ton of new rubber in the form of new tires.

Reclamation of scrap rubber could be accelerated by advancing the price, which is now frozen at about one-third the price of new rubber. A markup to a level coinciding with one-half to two-thirds the price of new rubber should be authorized to create a stronger incentive to reclamation. The burden of constructing reclaiming plants must fall on the rubber companies, but the oil companies with filling stations in every hamlet and in continuous contact with the public should be willing and able to sponsor a comprehensive program of scrap rubber collection and purchase in the interest of all concerned. Joint action of oil and rubber companies with Government cooperation would be necessary to accomplish satisfactory results.

A broader and longer-range program should also be instituted, looking to the potentialities inherent in natural rubbers from the Western Hemisphere, such as guayule from Mexico and wild rubber from Brazil.

Such a program of reclamation and stimulation of secondary supplies would not obviate the eventual necessity for obtaining natural or synthetic rubber for civilian use, because reclaiming and recapping are limited by the facts that casings will not last forever, rubber can be reclaimed only about three times, and the supply of scrap, although large, is not inexhaustible.

Reclaiming plants cost only about one-tenth as much per ton of capacity as synthetic-rubber plants, but the dilution of scrap rubber with fillers and softeners requires the processing of two tons to yield the equivalent of one ton of raw rubber, thus raising the investment cost to one-fifth that of synthetic output. This ratio provides a rough measure of the impact that such plans would have upon the war effort. A substantial proportion of existing reclaiming equipment, however, is operating below capacity and the output of reclaimed rubber might be advanced as much as 40 per cent above 1941 levels without new construction.

●

Safety Men to Discuss Defense

The January meeting of the Petroleum Safety Council, called for January 26 at the Mayo Hotel, Tulsa, will be given over to topics relating to the national-defense program.

Personal Paragraphs

J. HARVEY DUNN, South Texas independent operator, has been installed as mayor of Alice, Tex., to fill the unexpired term of C. D. Jones, resigned. Mr. Dunn retired from the board of directors of the Alice Chamber of Commerce this year after serving three terms.

B. G. MARTIN, Midland, Tex., geologist for Gulf Oil Corp., has been named petroleum analyst under the Office of Petroleum Coordinator. He will be stationed at Houston, Tex., District 3 headquarters, and his activities will have to do with West Texas, New Mexico, and the Panhandle.

JEFF W. MITCHELL, engineer with Phillips Petroleum Co., has moved from Kansas City, Kans., to Bartlesville, Okla.

MERL DEMPSEY, superintendent for Magnolia Petroleum Co. at Seminole, Okla., has been transferred to Brownfield, Tex.

E. G. WOODRUFF, Tulsa geologist, has donated his collection of 1,702 geological publications to the Tulsa library system. The collection contains some out-of-print state bulletins.

ROBERT T. WILSON, president of the La Gloria Corp., Corpus Christi, Tex., was elected president of the Corpus Christi Community Club last week.

W. H. WYNN, of the geological staff of Sinclair Prairie Oil Co., has been transferred to East Lansing, Mich., to be in charge of the land-geological office of the Tulsa firm.

HARRY T. HUNTER, engineer, Stanolind Oil and Gas Co., Fort Worth, Tex., has been moved to Tulsa, and LOUIS FINCH, production engineer, took over Mr. Hunter's duties at Fort Worth.

CHARLES A. SON, independent operator in California and formerly of the state Industrial Accident Commission, has been elected the twelfth president of the Lawyers' Club of Los Angeles.

L. L. BAXTER, manager of the Arkansas Western Gas Co., Fayetteville, Ark., has been elected president of the Northwest Arkansas Chamber of Commerce. He was president of the Northwest Arkansas Blossom Pilgrimage Association in 1940.

JOHN M. PRITCHARD has been elected president of McColl-Frontenac Oil Co., Ltd., Montreal, Canada, succeeding J. A. Wales, deceased. C. P. TOMLINSON has been named vice president. Both men were formerly vice presidents, members of the executive committee and directors. THOMAS C. TWYMAN, formerly assistant manager of the central territory of the sales department of the Texas Co., was elected a director and vice president in charge of marketing, and G. R. TAYLOR, formerly manager of refining operations for the company, has been appointed vice president in charge of refining.

C. B. WILLIAMS, manager, Texas-New Mexico division of the producing department of Texas Co., addressed the Fort Worth Geological Society at its weekly luncheon last week. His subject was "Matters of General Interest in Connection With Producing Operations on the Barco Concession of Colombia." Mr. Williams recently returned from a 2-year stay in charge of the Texas Co.'s properties in Colombia.

HAROLD G. NEELY, president, Iron Mountain Oil Co., Fort Worth, Tex., has announced dissolution of the company, which has holdings in West and West Central Texas. The company will distribute its assets among the stockholders. Mr. Neely will remain in Fort Worth as an independent operator. R. C. BARTHOLD, secretary-treasurer of Iron Mountain, has been called to active service with the Air Corps.

HOMER A. SCOTT, who has been district land man at Wichita, Kans., for Ohio Oil Co., has succeeded W. J. WILSON as head of the land department, and J. M. BARRETT, JR., who has been at Edmond, Okla., goes to Wichita. VIRGIL C. COLE, of the Tulsa office, has been transferred to Edmond. H. T. CARPENTER, who has been chief scout under Mr. Wilson, will continue in the same position under Mr. Scott.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

R. L. Welch, the new general utility man of the Western Oil Jobbers Association, is a resident of Knoxville, Iowa. He has been general counsel for the association and succeeds Horace G. James as secretary and general manager.

J. E. Love has been reelected chairman of the Oklahoma Corporation Commission and thus enters upon his sixth consecutive term.

There may be an embargo placed on flooding methods followed in some of the oil fields of Pennsylvania.

20 YEARS AGO

That 200,000 of the 265,000 oil wells in the United States produce an average of only 2.4 bbl. a day was the interesting assertion made by Harry H. Smith, secretary of the Mid-Continent Oil and Gas Association, when he appeared before the finance committee of the Senate in Washington recently.

Walter H. Jeffrey has written a book entitled "Deep Well Drilling," giving the principles and practices of deep drilling and containing also a handbook of useful information to drillers and others engaged in oil production.

The pumping of oil was discussed broadly in a lecture to the engineering students of the A. and M. College of Texas by J. Edgar Pew, vice president of the Sun company of Dallas.

10 YEARS AGO

Harvey Willson has been appointed secretary of the Pennsylvania Grade Crude Oil Association succeeding Rodney J. Alexander, resigned.

In a recent analysis of oil-field pumping troubles it was found that 25 per cent of the lost production was caused by sucker-rod trouble, writes Emory Kemler, Gulf Research Laboratory, Pittsburgh, Pa.

JOHN A. BROWN, president, Socony-Vacuum Oil Co., Inc., has been appointed chairman of the petroleum division of the Red Cross of Greater New York City.

JEROME B. FISHER, Jamestown, N. Y., who last November completed 40 years' service with National Fuel Gas Co. and affiliates, became officially retired December 31.

H. C. WIESS, president, Humble Oil and Refining Co., Houston, Tex., has been named a member of the Texas committee for the celebration of the president's birthday, which will be held at Houston, January 30.

A. JACOBSEN, New York City, president, Amerada Petroleum Corp., has been on a tour of the company's properties in Louisiana and Texas. He was accompanied by a party of officials of the Tulsa office.

EDMUND JUSSEN, consulting geologist and engineer and at one time a member of the geological staff of Union Oil Co., has joined the force of Commander Osgood, in the OPC District 5 office at Los Angeles, Calif.

C. A. BREEN, vice president and general manager of Sylvestre Oil Co., since 1937, has been appointed assistant manager of Colonial Beacon Oil Co.'s New York State division, with offices in New York City. He will continue as vice president of Sylvestre.

R. C. SCHOGGINS was elected recently as new president of the Humble Club, composed of over 1,700 employes of Humble Oil & Refining Co. BOB LAW was elected first vice president; F. M. HUGHES, secretary; SAM K. McLELLAND, treasurer, and PAT COLLERAIN, auditor.

C. C. MILLER, a former member of the geological department of the Texas Co., has become geologist of Renwar Oil Co., Corpus Christi, Tex.

BARTON P. SIBOLE, vice president, Stanolind Pipe Line Co., Tulsa, has been named chairman of the Chamber of Commerce public affairs forum committee.

RONALD K. DeFORD, Argo Oil Corp., has been elected president of the West Texas Geological Society, Midland, Tex. WALTER G. MOXEY, Stanolind Oil & Gas Co., was chosen vice president, and LLOYD HASELTINE, Magnolia Petroleum Co., secretary-treasurer.

EUGENE L. AMES, Gladewater, Tex., Chamber of Commerce director, and independent oil operator, has accepted an executive position with Gilcrease Oil Co. He has been associated with C. RHEA STARNES in the oil business. He and his family will move this month to San Antonio, Tex.

WILLIAM F. BATES, who has been an assistant engineer in the field department of Shell Oil Co., Inc., at Ventura in the coastal district of California, has been promoted to engineer and has been transferred to the drilling department in the Los Angeles, Calif., headquarters of the company.

J. W. CARNES, vice president, Consolidated Oil Corp., New York City, has been appointed chairman of the marketing committee for District 1 of the Office of Petroleum Coordinator. He succeeds H. W. DODGE, vice president, Texas Co., who resigned to accept a position with the Office of Production Management.

WALTER S. PARKER, night superintendent of light oils division at the Whiting, Ind., refinery of Standard Oil Co. of Indiana, last week celebrated the conclusion of 50 years of service with the company. In honor of the occasion, the board of directors presented him with a gold watch. Mr. Parker was only 9 years old when he joined the company as a call boy.

Waterboy to President

From waterboy to president is the literal integration of the record of J. A. Warren, who last month was elected executive head of the Kinney-Coastal Oil Co., of Denver, Colo., to succeed Eugene D. Milliken, appointed by Governor Carr to fill out the unexpired term of the late Alva B. Adams, United States senator from Colorado. Mr. Warren's business career started in 1892 as waterboy for a construction gang working between Virginia Point and Texas City in Texas. Two years later he moved to Colorado and continued in more advanced stages of that line, to which was added equipment salesmanship. Then in 1915-16 he was appointed secretary of the newly created Colorado Industrial Commission, which had to be organized from the ground up.

J. A. WARREN

Mr. Warren joined the staff of the Kinney-Coastal Co. in 1922, first as secretary, then as field man, and by stages was made a director, treasurer, member of the executive committee, vice president, and finally president. He has the unique distinction of now filling an office that twice has been vacated by the occupant resigning to go to Washington to become a senator. The first was the late Karl C. Schuyler, and the second was Mr. Millikin. When Mr. Warren first came to Colorado he lived in a mining town up in the mountains where he and the late Douglas Fairbanks were classmates. In World War 1 he served with the A.E.F. in France in charge of Le foyer Bis Soldat in construction of the French Y.M.C.A. in Paris.

He and Bessie Boyington were married in 1902 in Fort Collins, Colo., and to the union were born five sons and one daughter. Two of the sons, Ralph and Howard, are in the oil business at Houston, Tex. Eugene is with the Lockheed Aircraft Corp., Karl is with the Consolidated Aircraft, and Guy is secretary of a Montana irrigation company. The daughter, Gretchen, is now Mrs. R. J. Watson, whose husband is in the geophysical department of the Carter Oil Co. at Tulsa.

LESLIE C. RICKEY, Stanolind Pipe Line Co. engineer, has been transferred from Marysville, Tex., to Drumright, Okla.

MARTIN DAVEY, JR., oil man of Palestine, Tex., has been elected president of the Palestine Chamber of Commerce.

GORDON HEID, geologist, Shell Oil Co., Inc., Houston, Tex., entertained the Houston Geological Society's weekly meeting last week with moving pictures of the Dutch East Indies.

J. W. KEOUGHAM, formerly with W. EARL ROWE, independent oil operator, of San Antonio, Tex., has joined Forest Development Co., as head of its land office at San Antonio.

S. F. MAGOR, general superintendent, Superior Oil Co., with offices in Los Angeles, Calif., was a visitor in Tulsa last week. He has been spending a large portion of his time in Washington, D. C.

W. J. WILSON, who has been assistant secretary and head of the land department of Ohio Oil Co., with offices in Tulsa, has resigned to become a director of Leader Oil Co., Tulsa, and has been made executive vice president.

J. FRANK DRAKE, president, Gulf Oil Corp., has been elected a member of the board of directors of Chase National Bank of New York City. Mr. Drake is a member of the executive committee of the Petroleum Industry Council for National Defense, and is a director of the American Petroleum Institute.

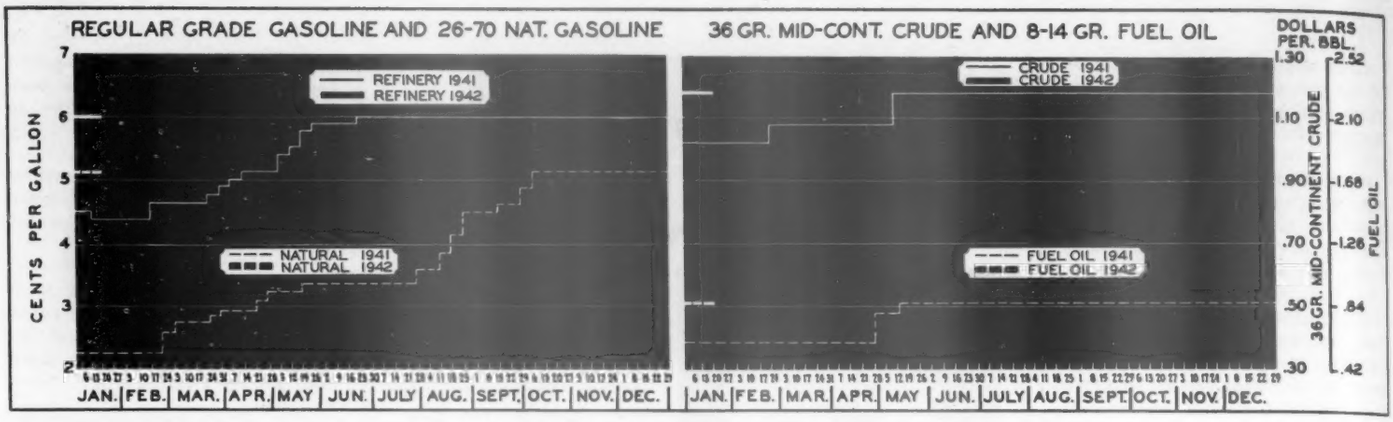
EVERETT McCULLOUGH, of Fain-McGaha, Inc., Wichita Falls, Tex., has been elected president of the Wichita Falls Chamber of Commerce for 1942. JOHN F. O'DONOHOE, independent oil operator, was presented by the Wichita Ad Club with a loving cup at the meeting of the chamber, one of two awarded annually to outstanding citizens of the county. Mr. O'Donohoe received his award in appreciation of his many philanthropies during 1941.

E. E. De GOLYER, consulting petroleum engineer, Dallas, Tex., was presented with the John Fritz Medal of the A.I.M.E., highest award in the engineering profession, at a dinner last week in the Waldorf-Astoria Hotel, New York City. Speakers at the dinner included JOHN M. LOVEJOY, president, Seaboard Oil Co., and WALLACE E. PRATT, vice president, Standard Oil Co. of New Jersey. JOHN R. SUMAN, vice president, Humble Oil & Refining, and A.I.M.E. president, presided.

Shifts: ART HAYWARD, superintendent, Olson Drilling Co., Olney, Ill., to Rankin, Tex.; J. L. HOLLIS, Seismograph Service Corp., Olney, Ill., to Fairfield, Ill.; R. A. MITCHELL, engineer, Kendall Refining Co., Bradford, Pa., to Bel Air, Md.; HOWARD GRAHAM, superintendent, Tytex Oil Co., Salem, Ill., to Tulsa; K. M. LAWRENCE, geologist, Amerada Petroleum Corp., Crawford, Nebr., to Woodward, Okla.; R. L. RANKIN, engineer, Shell Oil Co., Inc., Stroud, Okla., to Tulsa; H. D. CHRISLIP, engineer, Gulf Oil Corp., Oilton, Okla., to Lyons, Kans.; W. B. ALEXANDER, superintendent, Zephyr Drilling Co., Bristow, Okla., to Winfield, Kans.; JOE McMAHON, geologist, Benedum-Trees Oil Co., Fairmount City, Pa., to Parkersburg, W. Va.; R. G. DALY, engineer, Shell Oil Co., Inc., Electra, Tex., to Perry, Okla.; LEO W. KONZ, engineer, Carter Oil Co., Jackson, Miss., to Hope, Ark.; STANLEY W. WILCOX, Seismograph Service Corp., Wichita, Kans., to Tulsa; CARL W. BLAKELY, engineer, Seismograph Service Corp., Greensburg, Kans., to Fort Stockton, Tex.

D. E. BUCHANAN left Tulsa last week to assume his duties as director of the natural-gas and natural-gasoline section of the producing division of District 2 of the Office of Petroleum Coordinator for National Defense, with headquarters at Houston, Tex. He was granted a year's leave of absence as vice president of Hanlon-Buchanan, Inc.

LEONARD C. RITTS, president, Devonian Oil Co., was elected director of the National Bank of Tulsa, on Tuesday, January 13. Mr. Ritts has been with Devonian since 1925, serving as vice president and treasurer from 1925 to 1941 when he was elected president. He has been a member of the board of directors of Oklahoma Natural Gas Co. since 1933.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK, Jan. 20.—Disclosure of the transfer of 40 tankers from Atlantic to Pacific service plus the fact that in the week ended January 10 withdrawals from East Coast storage were at a new seasonal high emphasized the fears that rationing of petroleum products in this area some time during 1942 is not as remote as many believe. The withdrawal of the tankers combined with heavy demand for petroleum products to place the market in the strongest position it has enjoyed in months.

Public disclosure of the tanker transfer was made late last week. It was revealed that 40 tankers in all will be sent to the Pacific, 15 of which have already been transferred. This would be equivalent to the number returned from the British shuttle service and would, therefore, return the East Coast supply situation to a condition similar to that which prevailed in the late summer and early fall.

The effect of the transfer has been evident in the rapid decline in East Coast stocks in recent weeks. This decline has been particularly heavy in the past 2 weeks when more than 5,000,000 bbl. were withdrawn from storage. This is 2½ times the average rate for the preceding 4 weeks. Total withdrawals since the end of November were about 9,500,000 bbl., 11.5 per cent of the total in storage at that time. This is not considered abnormal in view of the season but a continuance of the trend of the 2 weeks ended with January 10 is regarded with concern.

If this rate were continued it would result in a total reduction at the end of 8 weeks of 20,000,000 bbl. which would reduce stocks to slightly more than 50,000,000 bbl. by the end of the first week of March. If tire rationing achieves the reduction in gasoline consumption estimated by the OPC such a situation might not necessarily be serious but if opinions held by some, but not by all oil companies, prove correct and gasoline demand is sustained, the effect of continued heavy withdrawals would make the problem of motor fuel supply difficult next summer.

Mid-Continent

CURTAILED operation of automobiles throughout the country resulting from the rubber-shortage phobia has not made a serious impact on the Mid-Continent refinery gasoline market through the first few weeks of its presence. Shipments of gasoline to northern consuming points have been maintained at volumes reasonably close to expectations for the season.

There has been no inclination on the part of refiners to lower tank-car quotations and most sales managers agree that they would be reluctant to discount current quotations because of the continued high replacement cost. Crude markets are strong and buyers are still soliciting connections in Oklahoma and North Texas.

Shipments of distillate burning oil from Mid-Continent refineries settled into routine winter channels during the week. Plant operators reported the demand to be brisk at unchanged prices. Contract customers in most of the extreme northern cities are asking for maximum quantities specified in their contracts.

Restatement of the petroleum-price policy of the Office of Price Administration in Washington, D. C., early this week temporarily ended hopes that some may have entertained for permission to institute a general advance in product quotations. Leon Henderson, price administrator, again pointed out that a nation-wide survey of production, refining and marketing costs is now under way and that results of this analysis will be the determining factor in future prices.

Resumption of large-scale use of tank cars in delivering crude and refinery products to the East Coast in railroad tank cars may again open the way for Mid-Continent plants to participate in supplying demand from that section of the country.

Kerosene is moving in substantial volume from Mid-Continent plants at unchanged prices. Northern distributors are adding to inventories anticipating even stronger demand within 6 weeks from the use of space heaters and in tractors for spring planting.

Sentence Summaries

MID-CONTINENT: Gasoline movement steady, kerosene and distillate fuels in firm demand.

EAST COAST: Transfer of tankers may result in deficiency of supplies.

GULF COAST: Spot trading is at a minimum. Lend-lease stocks piling up.

PACIFIC COAST: Gasoline soft. Buyers cautious, fearing interruptions in transportation.

PENNSYLVANIA: Market steady and unchanged at previous price levels for all products.

A.P.I. REFINERY REPORT

(Week ended January 10)

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks: Gasoline	Residual	Gas oil
East Coast	603	19,863	11,053	17,727
Appalachian	149	3,943	516	391
Ind., Ill., Ky.	707	18,732	4,358	4,870
Okla., Kans., Mo.	371	8,962	2,227	1,339
Inland Texas	205	3,317	1,493	134
Texas Gulf	1,037	16,310	9,173	8,277
Louisiana Gulf	156	3,465	2,445	1,697
N. La. and Ark.	87	851	374	90
Rockies	91	1,865	602	290
California	485	16,896	62,644	12,434
Total Jan. 10, 1942	3,891	94,204	94,885	47,250
Total Jan. 3, 1942	3,961	92,987	95,857	49,357
Total Jan. 11, 1941	3,543	85,894	100,553	41,623

Note: Total refinery runs and refinery stocks for week ended January 17, 1942, appear on Trends page.

CRUDE-OIL STOCKS

(Bureau of Mines Estimate)

Week ended:	Bbl. of crude*
January 10, 1942	244,364,000
January 3, 1942	244,440,000
January 11, 1941	259,342,000

*Excludes heavy, unrefinable crude in California.

Gulf Coast

HOUSTON, Tex., Jan. 19.—A slightly easier tone is developing in gasolines on the Gulf Coast but so far prices have shown no indication of softening. The easier tone still is only in comparison to the extremely tight situation which has existed for several months and as yet no great amount of material is being made available on the Gulf Coast. Most refiners still are fairly well sold ahead and with any additional lend-lease demand that may develop, the structure could firm again quickly.

Kerosene, in contrast, is somewhat tighter. There have been a few spot sales recently by several of the larger refiners but generally there is very little material available. Kerosene has been reported at 4.25 cents for immediate shipments but sources of supply at that figure are limited and buyers indicate they would expect to pay at least 4.375 cents to 4.5 cents to draw out much material.

No. 2 fuel appears slightly weaker but there is little in the way of actual sales upon which to base definite conclusions. Several refiners have been carrying fairly large supplies of this product, and although there has been no particular effort to push sales, the outlook is regarded as not too encouraging. The fact that most of the stocks are in fairly strong hands is about all that is delaying a slump in the market. While the nominal market is around 4 to 4.25 cents, suppliers consider the product worth more than that figure in relation to other materials and are reluctant to sell.

Pegging of Bunker C prices on the Gulf Coast at 85 cents has forestalled a price advance in that market. Prior to the establishment of the ceiling, quotations were being moved up to a low of 90 cents in line with a definite tightening of material. Most sellers already had boosted quotations to a low of 90 cents with some asking up to 96 cents.

Gas oils continue in good position with only limited supplies outside of lend-lease commitments on hand.

REFINERY AND TANK-WAGON PRICES

(Prices as of January 20)

Refinery Gasoline

Octane (A.S.T.M.):	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	6.000-6.250	.....	5.625-5.875	5.250-5.500
Pennsylvania	7.750-8.000	6.750-7.000	6.750-7.000	.....	.....	.....
Gulf Coast	6.625-6.875	.....	6.250-6.375	6.250-6.500	.....	.....
Northeast Coast	8.500	.....	8.000	8.000	.....	.....
Pacific Coast	7.000-7.500	.....	6.625-6.875	.....	6.375-6.500	.....

*Basis Oklahoma Group 3.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(375-390)
Oklahoma	5.125	6.125-6.250	.....
North Texas	4.750	5.625-5.750	.....
North Louisiana	4.750	5.625-5.750	.....
California	.....	.....	4.500-5.000

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Oklahoma	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	4.375-4.500	.....	.....
Pennsylvania	6.250-6.500	6.375-6.725	.....	.....	.....
California	.....	.....	.....	4.500-6.000	4.500-5.000
Northeast Coast	.....	.....	.....	5.300	.....
Gulf Coast	.....	.....	.....	4.250-4.500	.....

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48°G.	24 D.I.	48-52 D.I.	58&above	Diesel bunkers	Bunker C
Mid-Continent	4.125-4.250	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	.....	$0.75-85
Gulf Coast	.....	.....	4.125-4.250	4.250-4.375	$1.45	0.85-90
Northeast Coast	.....	.....	.....	5.200	2.15	1.35
North Louisiana	.....	.....	.....	.....	.....	*0.80-0.85

*10-14° gravity.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent	3.6-3.8	3.5-3.7	$0.85-90	$0.85-90
Pennsylvania (West)	5.6-6.0	5.5-6.0	*5.5-5.875	.....
Northeast Coast	5.2	5.2	$1.65-75	$1.35
Pacific Coast	5.5	5.5	†0.85-95	‡0.80-85
Gulf Coast	4.0	.....	1.65	0.85-90

*36-40 gravity fuel oil †Pacific specification 300. ‡Pacific specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.50
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	18.00

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.50
500-3½	20.50
600-3½	21.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oil

CALIFORNIA—		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2.000-4	10.50	10.75
3.000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		38.50
Zero pour point		37.50
10 pour point		36.50
15 pour point		31.00
25 pour point		
200 vis., at 70° F., 3 color:		
Zero pour point		40.50
10 pour point		39.50
15 pour point		38.50
25 pour point		33.00

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	.....
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	.....
124-126 (A.m.p.) w.c. scale	.....

NEW YORK—	
Wax in bags fully refined:	
130-132 (A.m.p.) wax	.....
133-135 (A.m.p.) wax	.....
Crude scale:	
124-126 (A.m.p.) w.s.	.....
124-126 (A.m.p.) y.s.	.....

Note: Most refiners are not quoting on wax pending interpretations of OPA order.

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene 41-43	Diesel fuel 24 G.	Diesel fuel 48-52 D.I.	Diesel fuel 58 D.I.	Bunkers	Bunker C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	.....	1.35-45	*0.85-90

*Pacific specification 400.

Lubricating Oils

	Neutral oils 200-3	Neutral oils 150-3	Bright and cylinder stocks 200-3	Bright and cylinder stocks 150-3	Bright and cylinder stocks 600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Baltimore, Md.	14.75	5.50	8.70
Boston, Mass.	13.70	4.50	8.00
Burlington, Vt.	15.70	5.50	8.30
Buffalo, N. Y.	15.00	5.50	8.30
Dover, Del.	15.50	5.50	10.50
Hartford, Conn.	14.40	4.50	7.80
Manchester, N. H.	16.10	5.50	9.00
Newark, N. J.	14.00	4.50	7.90
New York, N. Y.	14.90	5.50	8.00
Philadelphia, Pa.	15.00	5.50	10.15
Pittsburgh, Pa.	15.50	5.50	10.50
Portland, Me.	15.10	5.50	8.10
Providence, R. I.	13.80	4.50	7.80
Washington, D. C.	13.00	3.50	9.20
Average 14 cities	14.75	5.07	8.72

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.25	8.00	8.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	15.00	7.00	8.00
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	14.90	5.57	9.44

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Atlanta, Ga.	18.50	7.50	10.00
Birmingham, Ala.	19.00	8.50	9.00
Charleston, S. C.	17.75	7.50	.....
Charleston, W. Va.	18.05	6.50	11.50
Charlotte, N. C.	18.90	7.50	9.50
Jacksonville, Fla.	18.50	8.50	8.00
Jackson, Miss.	18.00	7.50	9.00
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.75	8.50	*10.50
Norfolk, Va.	16.25	6.50	10.20
Average 11 cities	17.95	7.59	9.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero tank wag.
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero. tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	4.50	11.50
Average 3 cities	16.17	5.17	12.17
Average 50 cities	16.03	5.96	9.80
Average last week	16.04	5.96	9.80

Wisconsin Price Raises Authorized

WASHINGTON, D. C., Jan. 19.—Upward adjustments of depressed tank-wagon prices of gasoline were permitted in an action by Price Administrator Leon Henderson late last week, for five communities in Wisconsin.

Permission to adjust the Wisconsin prices came after an investigation by the Office of Price Administration disclosed that competitive conditions in that area had brought prices on November 7, when Mr. Henderson "froze" all petroleum prices, to a point where jobbers' margins had disappeared and some jobbers were selling at prices below their tank-car-purchase prices.

Marketers of gasoline in the Des Moines, Iowa, area were notified at the same time that normal consumer tank-wagon price differentials above dealer tank-wagon prices are to be observed at not more than 2 cents per gallon on premium grade, 1.5 cents on regular grade, and 1 cent on third-grade gasoline.

Selected Crude Prices

Ben Franklin Refining Co. adjusted its crude postings upward in southern Oklahoma, to conform with the regular Mid-Continent gravity scale, ranging up to $1.25 per barrel, effective December 4, 1941. The company now pays the scale posted under Column 6 in the Journal's Oklahoma and Kansas gravity table published on Page 73, January 8.

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	2.77

Gravity Schedules

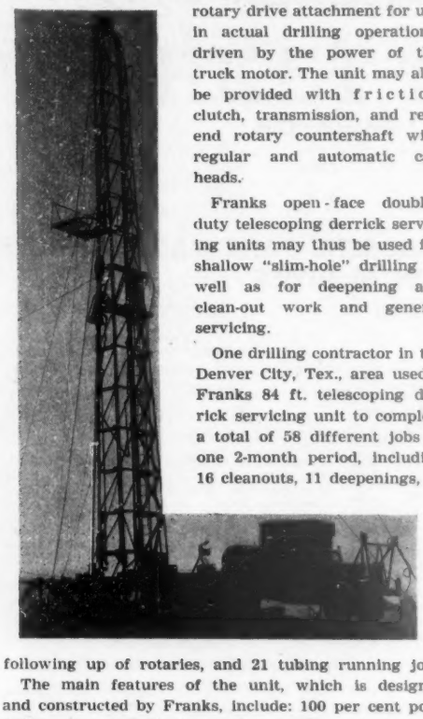
Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas, Lea County, N.M.
18-18.9	$0.80	.....	.....	.....
19-19.9	.84	.....	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	.....	1.07	1.30	.94
32-32.9	.....	1.09	1.32	.96
33-33.9	.....	1.11	1.34	.98
34-34.9	.....	1.13	1.36	1.00
35-35.9	.....	1.15	1.38	1.02
36-36.9	.....	1.17	1.40	1.04
37-37.9	.....	1.19	1.42	1.06
38-38.9	.....	1.21	1.44	1.08
39-39.9	.....	1.23	1.46	1.10
40 and above	.....	1.25	1.48	1.12

EQUIPMENT PROGRESS...

Franks Servicing Unit Built for Many Jobs

All the elements of versatility are incorporated in this Franks Manufacturing Corp. of Tulsa portable telescoping derrick servicing unit, shown here with a rotary drive attachment for use in actual drilling operations, driven by the power of the truck motor. The unit may also be provided with friction clutch, transmission, and rear end rotary countershaft with regular and automatic catheads.



Franks open-face double-duty telescoping derrick servicing units may thus be used for shallow "slim-hole" drilling as well as for deepening and clean-out work and general servicing.

One drilling contractor in the Denver City, Tex., area used a Franks 84 ft. telescoping derrick servicing unit to complete a total of 58 different jobs in one 2-month period, including 16 cleanouts, 11 deepenings, 10 following up of rotaries, and 21 tubing running jobs.

The main features of the unit, which is designed and constructed by Franks, include: 100 per cent portability; line and blocks carried strung; patented mechanical raising and lowering device; derrick raised by power used to drive hoist; raises in seven minutes to save rig-up and tear-down time; requires only four guys at derrick top; rotary attachment available; open face design; can be left standing in the field while the hoist is used under standard derrick or with other equipment.

The derrick folds down over the truck to a length of 54 ft. for over-the-road travel.

Flocontrol Valves Provide Precision in Process Control

Valve designers have developed a new type—the Flocontrol valve made by Manning, Marvell & Moore, Inc., Bridgeport, Conn.—which proportionately controls the amount of flow. This development is exactly what process engineers had been waiting for, and it was said by a number of leading valve industry designers to be the greatest development made in manually operated valves during the last decade.

Strangely enough, Flocontrol valve incorporates no basically new principles, but the finished product combines a number of proven control features for the first time in a manually operated globe or angle valve. The most important of these is the type of valve disk used. It has a regular bevel type seating surface downward from which projects a cylindrical skirt through which are cut two inverted V-notches at right angles to each other. Disks similar to this have been used previously for many years in automatic pressure control regulators and instrument diaphragm control valves. The second important feature of these so-called Flocontrol valves is an indicating dial and pointer mounted on the valve stem and valve body so as to enable an operator to set the valve to one-hundredths of a turn and to duplicate this setting easily tomorrow or next month. This latter feature eliminates once and for all those makeshift arrangements so common in many plants used by operators to try and set an ordinary globe or angle valve somewhere near the same setting a second time.

After a series of empirical experiments the designers were able to develop a Flocontrol valve having a straight line flow curve. In simple language this just means that for each hundredth of a turn of the handwheel, this new Flocontrol valve always gives the same increase or decrease in flow.

Another important wrinkle in the design of these hair-line throttling valves is the fact that the shutoff seating surfaces are definitely separated from the V-port passages. This means that the handwheel of this particular type of valve must be turned a certain amount before the V-port disk is elevated sufficiently so that it clears the valve seat. By the time this has taken place, the two actual shoutoff seating surfaces have been separated a great enough distance that wire-drawing and steam-cutting do not affect them.

TRADE LITERATURE

LEEDS & NORTHRUP CO., 4934 Stenton Avenue, Philadelphia, Pa.—Catalog N-91-163, "Micromax CO_2 Recording Equipment for Flue-Gas Analysis," describing recent improvements in Micromax CO_2 recording equipment.

LINCOLN ELECTRIC CO., Cleveland, Ohio—Bulletin 412, describing and illustrating construction, uses and benefits of the self-indicating dual continuous control of the new Lincoln Shield-arc welder.

MEEHANITE RESEARCH INSTITUTE, 311 Ross Street, Pittsburgh, Pa.—A complete handbook on Meehanite castings, describing their manufacture, metallurgy, and engineering properties. The book contains 47 pages of facts important to engineers, designers, machinery manufacturers, and every user of castings.

BROWN INSTRUMENT CO., Wayne and Roberts avenues, Philadelphia, Pa.—A new 1942 calendar portraying the varied problems encountered in modern industrial processes by a series of original cartoons by Bill Eddy. The drawings have been reproduced in four colors to keep them as similar to the originals as possible. Along with the cartoons are included photographs and descriptions of the various industrial instruments and control devices manufactured by the Brown Instrument Co.

AMERICAN LOCOMOTIVE CO., Alco Products Division, 30 Church Street, New York City.—Bulletin 1030. It lists and shows pictures of all basic types of equipment made by the company. Included are more than 60 products which are directly applicable to the operation of refineries. One of the features of that section is the fin-type oil exchanger which the company is using in increasing numbers.

New B and W Device Useful On Workover Jobs

B and W, Inc., of Houston, Tex., and Long Beach, Calif., makers of B and W wall cleaning guides, have announced a new product called the B and W guide-mounted liner section, with the following field applications:

1. On deepening jobs below 5½ in. or 7 in. oil strings to correct high gas-oil ratios or water entrance.
2. On deepening jobs to develop lower productive sands.
3. On workovers where it is necessary to side-track out through a 5½ in. or 7 in. oil string.

It is desirable to use a liner with as large a diameter as possible on these workovers, and the reduced clearances make necessary the design shown in the cut. Wall cleaning guides are mounted in the wall of the casing and it is possible to run 4 in. O.D. liner through 5½ in. oil string or 5½ in. liner through 7 in. oil string.

The liner sections are made up in 6 ft. lengths of plain end pipe with two wall cleaning guides mounted at 3 ft. centers as shown. These sections may be threaded and coupled or inserted. Short liners may be made up entirely of a series of these sections. On longer liners, these liner sections may be installed at selected levels.

Standard cementing practice is followed in cementing this liner and the wall cleaning guides assist in centering the liner and removing the mud cake during the cementing operation.

Welding Authority Makes Extended Speaking Tour

James F. Lincoln, president of the Lincoln Electric Co., Cleveland, Ohio, has undertaken a war industry speaking tour and is urging arc welded construction to minimize bombing damage wherever possible. He will travel to 17 cities to speak before production men, manufacturers and engineers on methods of speeding war production by means of arc welding.

CLARK MARINE ENGINE PLANT EXPANDS

The 200-ft. extension to the Clark Bros. plant at Olean, N. Y., shown here, has just recently been completed to house the manufacture of large triple-expansion marine steam engines, in connection with the Government's defense program.

The new marine engine is the largest Clark has ever built, the 2,500-hp. unit being 22 ft. high, 23 ft. long, and 16 ft. wide. Stroke is 48 in. and speed 76 r.p.m.

Compounded Synthetic Rubber Is Used for Packings

The mechanical division of the Monarch Rubber Co., Hartville, Ohio, has developed, by compounding a new synthetic rubber, special shapes and sizes of packings and other molded and extruded parts that have exceptional oil resistance, flexibility and ability to seal pressures at extremely low temperatures and other desirable qualities not available with usual rubber parts.

Packings of this material are particularly desirable wherever there is a wide variation of temperatures.

Synthetics Expert Named Goodrich Research Head

Dr. Howard E. Fritz, manager of the synthetics division of the B. F. Goodrich Co. for the past 7 years and one of the best known technical men in the rubber industry, has been named B. F. Goodrich director of research by John L. Collyer, president.

Dr. Fritz came to B. F. Goodrich in 1925 from the engineering school faculty of Ohio State University, Columbus, Ohio, where he was graduated in 1914 with a degree of bachelor of science in chemical engineering; qualified for the degree of chemical engineering in 1920 and received his doctor's degree in 1921.

When he joined the Akron company, he was placed in charge of a small department engaged in bonding rubber to metal. Under his leadership this division grew to the extent that it was frequently referred to as "an industry within an industry." In 1934 he took over the direction of the development and sale of Koroseal, the synthetic elastic discovered in the company's laboratories, and compounded of limestone, coke and salt.

In his new position, Dr. Fritz succeeds James W. Schade, company research director since 1925, who has announced his retirement.

The company also announced appointment of William S. Richardson as general manager of mechanical goods and sundries sales, succeeding J. H. Connors, who has resigned because of ill health. Mr. Richardson entered the rubber industry in 1914, as a worker in the belt department of the Boston Woven Hose and Rubber Co., and in 1926 joined the B. F. Goodrich Co. on the staff of the assistant works manager. He was assigned soon afterward to the mechanical division, where he installed a planning and scheduling department, and stayed in that activity 2 years, extending the system to the processing division.

Cylinder Valve Suited to Internal-Combustion Engines

The RegO No. 2918 Cylinder Valve, manufactured by the Bastian-Blessing Co., 4201 Peterson Avenue, Chicago, Ill., is provided with an SAE flare outlet connection, making it suited ideally for use on internal-combustion engines.

In addition to functioning as a shutoff valve, the No. 2918 RegO valve also is provided with an excess flow check valve as an integral part of the inlet connection. The purpose of the excess flow check valve is to prevent excessive discharge of fuel to atmosphere in the event of a pipe, tubing or connection failure.

Two Firms Received Navy "E" Pennants

The Navy's highly coveted "E" (excellence) pennant and the Navy Bureau of Ordnance flag have been awarded to Monsanto Chemical Co. generally and to the Anniston, Ala., and Monsanto, Tenn., plants of the company specifically, the Navy Department announced.

The Kropp Forge Co., 5301 W. Roosevelt Road, Chicago, Ill., makers of steam hammer, drop and upset forgings, has also been awarded the Ordnance flag and the "E" pennant.

The Kropp company, founded in 1837, is among the very few suppliers of parts to have this honor bestowed upon them since it is customarily awarded only to those firms supplying finished equipment to the government.

The award was made to Monsanto, according to a statement by Secretary of the Navy Frank Knox, for outstanding performance in the production of naval ordnance material vital to national defense.

The "E" pennant and the Bureau of Ordnance flag will be flown from the flagstaff of the Monsanto general office in St. Louis and from the flagstaffs in the yards of the plants at Anniston, and Monsanto, Tenn. In addition, all men and women employes of the two southern plants, which are units in the phosphate division of the company, the phosphate division research laboratories and the phosphate division headquarters staff at Anniston, will be accorded the privilege of wearing the Navy "E" and the Bureau of Ordnance seal.

AMONG EQUIPMENT MEN...

Dayton President Joins OPM Rubber Division

A. L. Freedlander, president and general manager of the Dayton Rubber Manufacturing Co., Dayton, Ohio, has been appointed deputy to the chief of the rubber and rubber products division of the Office of Production Management. Mr. Freedlander has been in the rubber industry for 28 years.

Leaving the development division of one of the large Akron companies 21 years ago, he joined Dayton in the capacity of factory manager. Several years later he was made vice president and became president and general manager in 1936. Mr. Freedlander is credited with a long list of developments in rubber chemistry, engineering and manufacture. He served the Government during the first World War.

John M. Franklin Elected Worthington Director

The election of John M. Franklin, president of International Mercantile Marine Co. and president of United States Lines Co., to the board of directors of the Worthington Pump and Machinery Corp. has been announced.

Mr. Franklin was born in Baltimore County, Maryland, 45 years ago and was educated at Middlesex, and Harvard University. During the last war he was captain overseas in the U. S. Army, serving in the Tank Corps. He received the Military Cross for gallantry in action.

Mr. Franklin is also a director of Pan-American Airways, Manufacturers Trust Co., American Merchant Marine Institute, Northern Insurance Co. of New York, and a trustee of Atlantic Mutual Insurance Co.

Norton Appoints Salesmen For Three Divisions

R. D. Lawson has been appointed salesman by the machine division, Norton Co., Worcester, Mass., for northern New England which includes the states of Vermont, New Hampshire, Maine and parts of Massachusetts and Rhode Island. He succeeds W. E. Wickstrom who takes over sales engineering work at the main office in Worcester.

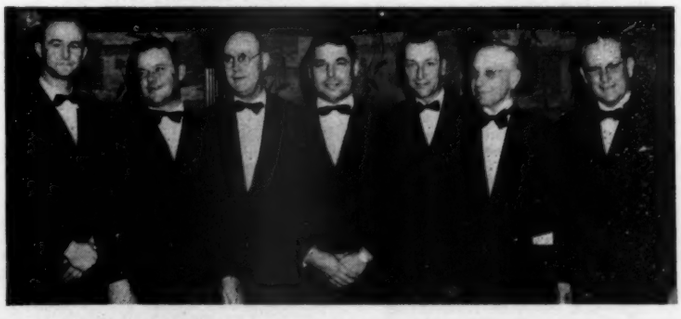
James K. Stevenson and Paul F. Sparrow have been appointed salesmen for the refractories division of Norton Co., and will have their headquarters in Chicago, Ill., and Pittsburgh, Pa., respectively.

BUSINESS NOTES

In cooperation with other tenants who have consolidated their office facilities in the General Motors Building in Detroit, due to increased defense activities, the International Nickel Co., Inc., announces the moving, as of January 1, 1942, of the Detroit office of its development and research division from the tenth floor, Room 10-227, to the eighth floor, Room 8-217, of the same building. The telephone number remains the same.

THREE NOMAD CHAPTERS ELECT OFFICERS

Three chapters of the Nomads—New York, Houston and Tulsa—held elections of officers last week. Russell D. Heath was chosen president of the New York group; R. L. Dudley, Gulf Publishing Co., was elected president at Houston; and C. O. Willson, editor of The Oil and Gas Journal, and one of the founding members, was elected president at Tulsa.



Newly elected officers of the Houston chapter of the Nomads are shown here. They are, left to right, Carl Vogt, W. J. Nutto, R. L. Dudley, O. W. Morgan, H. J. Craig, C. E. Whitney and Gordon Richmond

Other officers were:

New York, I. Frank Brown, vice president; Val R. Wittich, secretary; F. J. Olson, treasurer; A. V. Simonson, sergeant-at-arms; Charles J. Delay, assistant secretary; Herb E. Maland, assistant treasurer; G. B. Flanigan, deputy sergeant-at-arms; and James A. Thomas and J. H. Baird, members of the board of regents.

Houston, Gordon Richmond, Hughes Tool Co., vice president; H. J. Craig, Baash-Ross Tool Co., secretary-treasurer; O. W. Morgan, Byron Jackson Co., assistant secretary-treasurer; W. J. Nutto, Reed Roller Bit Co., sergeant-at-arms; Carl Vogt, Shaffer Tool Works, assistant sergeant-at-arms; and C. E. Whitney, Baker Oil Tools, Inc., national regent.

Tulsa, Paul E. Fitzgerald, Dowell, Inc., vice president; H. M. Cosgrove, secretary-treasurer (reelected); and W. G. Green, vice president of Engineering Laboratories, Inc., and Fred E. Cooper, Allis-Chalmers Manufacturing Co., national regents.

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Inquiries Invited
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CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

NEW Ordovician wildcat starting. Close in leases $1 to $2 per acre, chances for quick money. E. CROFT, PROCTOR, TEX.

WESTERN Kans. & Eastern Colo. 100,000 acres for lease or sale. Terms. Write Owner, John W. Baughman, Liberal, Kans.

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For Sale: Many Producing Oil Properties, Royalties, Drilling Blocks, and Oil Investments of various sizes in Mid-Continent area. Contact us to Buy or Sell properties.
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CONTROL offset McClosky production, 120-acre lease, 7/8 oil and gas, Wayne County. Devonian test, and $1,000 Cash. 2,000-acre block Edgar County, 1,000 acres Coles County, and 1,000 acres Cumberland County, want test. S. J. Burkitt, Mowequa, Illinois.

FOR SALE: 22 old, 1000 ft. wells, 5 powers etc., lease 700 acres, Jay Co. Indiana. 4326 Buell Dr., Fort Wayne, Ind.

PROVEN farmouts with fuel and water furnished. Minerals & Metals, Inc. 718 Gulf States Bldg., Dallas, Texas.

FOREST City Basin, 3,000-acre block, near McLouth; Will farm out. Harry Havnes, Grantville, Kansas.

Mailing Lists

ROYALTY owners, Oil investors, Unit holders, Stockholders, Operating personnel of oil industry. Oil Industry Mailing List Co., Tulsa Loan Bldg., Tulsa, Okla.

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WANTED: Experienced laboratory control operator for handling routine tests and controls. State experience and qualifications. Answers will be held confidential. Address Box A-841, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Capable refinery superintendent. Preference for technical training. State experience and qualifications. Answers will be held confidential. Address Box A-840, The Oil and Gas Journal, Tulsa, Okla.

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STRATEGIC ore mill and mine with good past production (tungsten) for sale account of other interests. Few thousand will handle. Box 352, Boulder, Colo.

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LOANS made on producing oil, gas and mineral lands. New York Note & Share Corp., 109 Broad St., New York City.

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HIGHEST cash prices paid for entire plants or individual production tools, milling machines, shapers, drill-presses, lathes, punch presses, electrical equipment and motors. Write us and a representative will call. COOK COUNTY MACHINERY CO., 1132 W. Lake St., Chicago, Ill.

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1—Parkersburg SC-11 Pumping Unit, stroke range from 60 to 132".

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25 K.W. and 40 K.W. Gas Engines, 220 volts. D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
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FOR SALE: 5 x 12 Oil Well Power Slush Pump with 100 H.P. Waukesha Motor. Melton Supply Co., Seminole, Okla.

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Sucker Rods, once run, in Okla. City field. Complete stock ¾", ⅞" and 1", available in truck loads of 10,000 ft. or more. These rods all alloyed. Delivered at reasonable point. Stock carried at Oklahoma City and Wichita, Kan.
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OIL STORAGE TANKS
3—55,000 Bbl.
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3— 5,000 Bbl.
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FOR SALE: 125 H.P. 200 W.P. Broderick Boiler, Code Condition, $975. Melton Supply Co., Seminole, Okla.

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20,000' 12¾" O.D. lapweld pipe.
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12-KW 125-Volt G. E. Generator, complete with switch board, etc. GILBERT PIPE & SUPPLY, Electra, Texas.

OFFER for immediate delivery from Oklahoma and Kansas points, subject to prior sale, approximately 50,000 feet 6⅝" O.D., 25,000 feet 8⅝" O.D. and 25,000 feet 5¼" O.D. All double random lengths, beveled for welding.
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To mud firms, users, processors and blenders of rotary drilling mud, for highly colloidal Eastern Wyoming type of bentonite, crushed and dried to specification ready for fine grinding, apply to Eastern Wyoming Bentonite Company, Moorcroft, Wyoming. No brokers.

FOR SALE at Oklahoma City: 1—100 H.P. Kewanee 200# W.P. oil field type boiler. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Ft. Worth H Spudder complete with tools, motor and lines. Good condition. Bob Johnson, Box 993, Abilene, Tex.

FOR SALE at Oklahoma City — 1—1930 "35" Allis-Chalmers Crawler Tractor, $400.00. Patridge, Cities Service Oil, Bartlesville, Okla.

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Large Stock of New and Used
BITS and STABILIZERS
3 & 4-way Drag Bits
Fishtail Bits
3 & 4 Wing Stabilizers
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Box 1177, Oklahoma City, Okla.

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500 GATE Valves, Globe Valves, FE and SE, from ¾ inch to 10 inch. GILBERT PIPE & SUPPLY, Electra, Tex.

BOOM TRACTORS AND TRENCHING MACHINE
FOR SALE—1 TA40 50 H.P. International Boom Tractor, equipped Trackson Pipe Layer complete with counterweights. 1 TA40 50 H.P. International Combination Boom Tractor, equipped Trackson Pipe Layer and Angle Blade. 1 32-Buckeye Trenching Machine, cuts widths 22-32 in.; depth, to 5½ ft. Heavy duty wheel equipped 14 bucket. 1 105-Austin Ladder Type Trenching Machine. Cuts width 22-42 in.; depth 6 ft. to 12½ ft. 1 Model D Backfiller. All A-1 Condition. Box A 842, The Oil and Gas Journal. Tulsa, Okla.

DRESSER COUPLINGS: For sale, about 2,000 12¾" OD Dresser couplings, also 500 8⅝" OD Dresser couplings and 500 4½" OD. Write Tri-State Pipe Company, Bellaire, Ohio.

CLOSE CLEARANCE PUMPS
FROM
RODESSA REFINERY, SHREVEPORT, LA.
4—5½ x 2 x 7 Dean Simplex.
1—14 x 6 x 18 Dean Simplex.
1—18 x 9 x 8 Dean Simplex.
Above are horizontal, single style, piston type, stainless steel trim. 400 lbs. on discharge, 300 lbs. on suction.
ALSO
3—10 x 4½ x 10 National Transit Duplex.
2—12 x 8½ x 10 Worthington Duplex.
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Above are horizontal, pot valve type, stainless steel trim.
All in Excellent Condition and Priced for an Immediate Sale.
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Phone 7-7334
Leonard H. Strauss, Resident Engineer
Main Office: Kansas City, Mo.
L.D. Phone 169
Harry B. Strauss, Manager

Journalisms:

DR. J. RUD NIELSEN, whose article, "Application of Spectroscopy in the Petroleum Industry," appears on Page 34 of this issue, studied physics at the University of Copenhagen from 1913 to 1919, and was instructor at the Royal Danish Technical College from 1919 to 1922. He came to this country as a fellow of the American-Scandinavian Foundation in 1922 and worked at California Institute of Technology. Since 1924 he has been connected with University of Oklahoma where he is a professor of theoretical physics. From 1931 to 1933 he did research work at the Institute of Theoretical Physics at Copenhagen on Guggenheim and Rask Oersted fellowships. He has published numerous research papers, mainly in the field of spectroscopy and molecular structure. Since the outbreak of the war in 1939 he has devoted most of his efforts to practical applications of spectroscopy. He was active in the establishment of the University of Oklahoma Research Institute and has directed several industrial research projects.

On February 2, Dr. Nielsen will address the evening meeting of the Tulsa Engineers Club on "Practical Applications of Spectroscopy."

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AT the present time the oil industry is faced with maintaining production in a national emergency where the supply of some materials will be none too plentiful. This places added importance on the reconditioning of wells of all types including recent completions and those which have been producing for years.

In next issue of the Journal the part of chemicals in reconditioning work will be discussed by P. E. FitzGerald. The article outlines the chemicals available to the oil industry, the different types of jobs and the success to be expected under various conditions.

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THE average well depths have been increasing from year to year as oil companies have sought deeper and deeper levels of production. Among next week's features will be one which will summarize the results of the drilling industry during 1941. This will include the total footage drilled and a breakdown showing wells drilled and depths.

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THE adequacy of the nation's oil reserves has become a matter of national importance. Whether or not sufficient new reserves were discovered last year to meet our requirements is only one phase of the problem. With present restrictions on drilling activity, are our reserves in flush fields capable of meeting a demand for stepped-up production? Are previously made estimates of reserves in the older fields holding up or are revisions of these estimates necessary? Are the revisions upward or downward? The Oil and Gas Journal will answer these questions next week.

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SOME useful work as well as some experimenting has been done recently by pipe-line construction men with several different types of ditching equipment which employ the plow principle. In visiting pipe-line construction projects in various parts of the country during the past year, Paul Reed, associate editor, has made a point of observing what is being done with these plow-type devices. A discussion of these together with comments on certain advances which have been made in similar kinds of equipment developed outside the pipe-line industry will be published in next week's issue.

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CALENDAR

January

LIQUEFIED PETROLEUM GAS ASSOCIATION, eastern section, Hotel Pennsylvania, New York, N. Y., January 22-23.

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division annual meeting, Engineers Building, New York, N. Y., February 9-12.

INDUSTRIAL SAFETY SECTION, fourth annual safety conference, Roosevelt Hotel, New Orleans La., February 22-24.

AMERICAN PETROLEUM INSTITUTE, Division of Production, southwestern district, spring meeting, Adolphus Hotel, Dallas, Tex., February 26-27.

NORTH TEXAS OIL AND GAS ASSOCIATION, Wichita Falls, Tex., February 28.

March

AMERICAN SOCIETY FOR TESTING MATERIALS, committee week and spring meeting, Cleveland, Ohio, March 2-5.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, spring convention and refiners and suppliers exhibit, Hotel Severin, Indianapolis, Ind., March 3-5.

AMERICAN PETROLEUM INSTITUTE, division of production, Pacific Coast district, spring meeting, Biltmore Hotel, Los Angeles, Calif., March 10.

WISCONSIN PETROLEUM ASSOCIATION, annual convention and equipment show, Schroeder Hotel, Milwaukee, Wis., March 18-20.

OKLAHOMA UTILITIES ASSOCIATION, annual convention, Biltmore Hotel, Oklahoma City, Okla., March 23-24.

WESTERN PETROLEUM REFINERS ASSOCIATION, thirtieth annual meeting, New Orleans, La., St. Charles Hotel, March 23-25.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, spring meeting, Houston, Tex., March 23-25.

AMERICAN PETROLEUM INSTITUTE, division of production, Mid-Continent district, Mayo Hotel, Tulsa, March 26-27.

April

AMERICAN PETROLEUM INSTITUTE, eastern district, Division of Production, William Penn Hotel, Pittsburgh, Pa., April 9-10.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Cincinnati, Ohio, April 15-17.

NATIONAL PETROLEUM ASSOCIATION, thirty-ninth semiannual meeting, Cleveland, Ohio, April 16-17, 1942.

SOUTHWESTERN GAS-MEASUREMENT SHORT COURSE, Norman, Okla., April 21-23.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, twenty-seventh annual meeting, Cosmopolitan Hotel, Denver, Colo., April 21-24.

PETROLEUM INDUSTRY ELECTRICAL ASSOCIATION, Washington-Youree Hotel, Shreveport, La., April 22-24.

May

AMERICAN GAS ASSOCIATION, thirty-seventh annual natural-gas convention, New Orleans, La., May 4-7.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Mayo Hotel, May 13-15.

NATIONAL ASSOCIATION OF PURCHASING AGENTS (oil-company buyers' group), Waldorf-Astoria Hotel, New York City, May 25-28.

June

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, semiannual meeting, Cleveland, Ohio, June 8-11.